DOCUMENT RESUME

ED 473 245 HE 035 597

AUTHOR	Jones, Elizabeth A.; Voorhees, Richard A.
TITLE	Defining and Assessing Learning: Exploring Competency-Based Initiatives. Report of the National Postsecondary Education Cooperative Working Group on Competency-Based Initiatives in Postsecondary Education. Brochure [and] Report.
INSTITUTION	National Postsecondary Education Cooperative.
REPORT NO	NCES-2002-175; NCES-2002-159
PUB DATE	2002-09-00
NOTE	185p.; Prepared with Karen Paulson.
AVAILABLE FROM	ED Pubs, P.O. Box 1398, Jessup, MD 20794-1398. Tel: 877-433-7827 (Toll Free). For full text of brochure: http://nces.ed.gov/pubs2002/2002175.pdf. For full text of report: http://nces.ed.gov/ pubs2002/2002159.pdf.
PUB TYPE	Reports - Descriptive (141) -- Tests/Questionnaires (160)
EDRS PRICE	EDRS Price MF01/PC08 Plus Postage.
DESCRIPTORS	Administrators; Case Studies; *Competency Based Education; *Educational Objectives; *Higher Education; Minimum Competencies; Models; Research Methodology; *Student Evaluation

ABSTRACT

This document includes a 3-page brochure describing the main report and the main report. The report explores competency-based models in postsecondary institutions and other learning environments. It is intended primarily as a guide for postsecondary educators who are interested in establishing such efforts at their institutions. The following sections are included: (1) "Introduction"; (2) "Defining and Classifying Competency-Based Initiatives: The Guiding Framework"; (3) "Methodology for the Case Studies"; (4) "Principles of Strong Practice"; (5) "Concluding Observations"; (6) "Annotated Bibliography"; (7) "Case Study Abstracts"; and (8) eight appendixes containing the individual case studies on which the report is based. These case studies include: King's College; Northwest Missouri State University; Sinclair Community College; Hagerstown Community College; Colorado Community Colleges Incumbent Worker Project; Western Governors University; Proficiency-Based Admission Standards System in Oregon; and Ford Motor Company. (SLD)

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A Report of the
National Postsecondary
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Announcing the release of the report,

Defining and Assessing Learning: Exploring Competency-Based Initiatives.

This report explores competency-based models in postsecondary institutions and in other learning environments. The report is intended primarily as a guide for postsecondary educators who are interested in establishing such efforts at their institutions.

Prepared by:

Elizabeth A. Jones
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and

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Competency-Based Initiatives Working Group

1 INTRODUCTION

Outlines background information about the Competency-Based Initiatives Project and charge to the Working Group of the National Postsecondary Education Cooperative.

2 DEFINING AND CLASSIFYING COMPETENCY-BASED INITIATIVES: THE GUIDING FRAMEWORK

Provides a conceptual overview of competencies, including key concepts and definitions, as implemented in a variety of settings. This framework can be useful as a starting point for institutions that previously have not considered competencies and their connection to the learning process.

3 METHODOLOGY FOR THE CASE STUDIES

Establishes the methodology used by the Working Group to select sites for the case study investigation. Gives practitioners a quick overview of the criteria used to determine cutting-edge case study sites as well as glimpses of key issues probed during interviews.

4 PRINCIPLES OF STRONG PRACTICE

Presents key principles about the following dimensions:

- Planning for competency-based educational initiatives
- Selecting assessment methods
- Creating and ensuring that learning experiences lead to competencies
- Reviewing assessment results to identify changes to strengthen student learning

5 CONCLUDING OBSERVATIONS

Outlines an agenda for future work and a call for action at the institutional level.

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NPEC The National Postsecondary Education Cooperative is a voluntary partnership of postsecondary institutions, associations, agencies, and organizations. NPEC's mission is to promote the quality, comparability, and utility of postsecondary data and information that support policy development at the national, state, and institutional levels. NPEC is funded by the National Center for Education Statistics (NCES), U.S. Department of Education.

ANNOTATED BIBLIOGRAPHY 6

Provides a selected annotated bibliography to resources about competencies.

CASE STUDY ABSTRACTS 7

Contains abstracts of the eight case studies presented in section 8.

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A. King's College
Explores a mature institution where competencies are embedded across courses in all academic programs and support important lifelong learning outcomes.

B. Northwest Missouri State University
Explores a competency-based educational system that is linked with a strategic planning process.

C. Sinclair Community College
Explores a competency-based educational system with particular focus on the development of competencies and how they are assessed.

D. Hagerstown Community College
Explores the development of modules for technical programs and the new ways that student competencies will be assessed and documented on career transcripts.

E. Colorado Community Colleges Incumbent Worker Project
Explores the beginning development of an incumbent worker project that builds competency-based curricula in conjunction with large employers. Most of these competency-based learning modules will be deliverable in electronic formats.

F. Western Governors University
Explores competency-based programs under development.

G. Proficiency-Based Admission Standards System in Oregon
Explores the development of a competency-based articulation system between secondary schools and public postsecondary institutions in Oregon.

H. Ford Motor Company
Explores the competency-based system used in a corporate site where employees are assessed in the beginning as potential new hires and then throughout their careers as they are considered for promotions.

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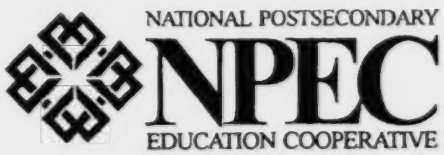
Defining and Assessing Learning: Exploring Competency-Based Initiatives

Report of the National Postsecondary Education Cooperative Working Group on Competency-Based Initiatives in Postsecondary Education



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Dear Colleague:

The enclosed brochure and executive summary describe an exciting new toolkit that may be useful to you. These materials were developed through a two-year federally funded project that assessed how competency-based initiatives are used in postsecondary institutions and in other learning environments. The report of this project, *Defining and Assessing Learning: Exploring Competency-Based Initiatives,* is intended primarily as a guide for postsecondary educators who are interested in establishing such efforts at their institutions. The report also provides policymakers and employers with a common understanding of how competencies can be applied in public, private, and industry settings.

The report contains an annotated bibliography that summarizes the state of the art in competency-based approaches to learning that should be helpful to individuals new to this emerging area, as well as to the experienced user. Also included in the report are eight case studies that examine competency-based models across public, private, and industry settings.

Defining and Assessing Learning, a product of the National Postsecondary Education Cooperative, sponsored by the National Center for Education Statistics, is available free of charge both on the Web (http://nces.ed.gov/npec/products.asp), and in hard copy. (To order the hard copy, call toll-free: 1-877-4ED-PUBS.) We hope you will find this guide useful in responding to the opportunities and challenges in this increasingly important area.

Sincerely,

Richard A. Voorhees
Director of Education Policy Initiatives
State Higher Education Executive Officers and
Chair, NPEC Competency-Based Working Group

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Defining and Assessing Learning: Exploring Competency-Based Initiatives

Report of the National Postsecondary Education Cooperative Working Group on Competency-Based Initiatives in Postsecondary Education

Prepared for the Council of the National Postsecondary Education Cooperative (NPEC) and its Working Group on Competency-Based Initiatives by Elizabeth A. Jones and Richard A. Voorhees, with Karen Paulson, under the sponsorship of the National Center for Education Statistics (NCES), U.S. Department of Education.

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Suggested Citation

U.S. Department of Education, National Center for Education Statistics. *Defining and Assessing Learning: Exploring Competency-Based Initiatives*, NCES 2002-159, prepared by Elizabeth A. Jones and Richard A. Voorhees, with Karen Paulson, for the Council of the National Postsecondary Education Cooperative Working Group on Competency-Based Initiatives. Washington, DC: 2002.

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FOREWORD

This report is a product of the National Postsecondary Education Cooperative (NPEC). It was undertaken as part of NPEC's ongoing efforts to explore various dimensions of postsecondary education outcomes.

Twelve individuals, each of whom had an extensive background in competency-based postsecondary education but in vastly different settings, were brought together. Their charge was to develop a project in the area of competency-based education that would be of value to a wide spectrum of the postsecondary education community. At its first meeting, this Working Group concluded that since competency-based initiatives were relatively new in postsecondary education, the most useful task they could undertake would be to develop a basic guide to postsecondary competencies. This guide would be intended for educators who were unfamiliar with the field but who might have an interest in establishing a competency-based initiative at their postsecondary institution. This report is the result of that undertaking.

It contains an annotated bibliography that introduces a novice in the field to basic materials about the construction and use of competencies. It includes the results of eight case studies of competency-based postsecondary programs that were identified by members of the Working Group as exemplifying diverse but interesting approaches. It also contains a set of operating principles that were gleaned by the Working Group and its consultants from commonalities among the eight case studies.

This report was reviewed and accepted by the NPEC Steering Committee as meeting NPEC's standards and policies. We hope users of this document will find it helpful as they begin or continue their explorations into competency-based postsecondary education.

Michael McGuire
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ACKNOWLEDGMENTS

The National Postsecondary Education Cooperative would like to take this opportunity to thank the members of the Working Group for contributing their time, enthusiasm, insights, and expertise to this project and this report. We would also like to thank all those individuals who reviewed this report. They included members of the NPEC Steering Committee, Dennis Carroll of NCES, Denise Glover of Westat, and the following five individuals who were asked to provide an independent review of the report:

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Finally, we would like to thank those individuals at the eight case study sites who shared their work with the authors and provided the necessary information that made this report possible.

NATIONAL POSTSECONDARY EDUCATION COOPERATIVE COMPETENCY-BASED INITIATIVES WORKING GROUP, 2000–2001

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EXECUTIVE SUMMARY

This document examines the use of competency-based initiatives across postsecondary education in the United States and presents principles that underlie successful implementation drawn from selected case studies. Conducted under the auspices of the National Postsecondary Education Cooperative, this project was informed by a Working Group of individuals selected for their expertise in utilizing competencies in a variety of settings. This project began in September 1998 and concluded in October 2000.

The world is changing and so is postsecondary education. Access to learning opportunities is greater now than at any previous time (Rosenberg, 2000; Voorhees, 2001). The learning paths created by advances in information technology no longer lead solely to postsecondary institutions. Organizations outside of postsecondary education have made significant inroads by providing performance-based learning opportunities built on competencies. It is now possible for more sophisticated education consumers, (i.e., students and potential students) to acquire skills and competencies through various means and at times they prefer. The Wingspread Group on Higher Education (1993, p. 14) noted that, "putting learning at the heart of the academic enterprise will mean overhauling the conceptual, procedural, curricular, and other architecture of postsecondary education on most campuses." Some colleges and universities have undergone dramatic transformations in response to this movement toward performance-based learning, while others have maintained a traditional curriculum packaged in standard delivery formats and provided in regular academic terms.

Competencies are the bridge between traditional credit hour measures of student achievement and the learning revolution. For the purposes of this project, a competency is defined as "a combination of skills, abilities, and knowledge needed to perform a specific task." "Competency-based initiatives," then, are those purposeful actions undertaken by postsecondary institutions directed at defining, teaching, and assessing competencies across their system.

Why is it important to implement competency-based initiatives in colleges and universities? One main reason is that specific articulations of competencies inform and guide the basis of subsequent assessments at the course, program, and institutional levels. Secondly, specific competencies help faculty and students across campus, as well as other stakeholders such as employers and policymakers, to have a common understanding about the specific skills and knowledge that undergraduates should master as a result of their learning experiences. Assuming that faculty use a formal process to get feedback about what the competencies should be, then stakeholders are more likely to accept and value them. Third, specific competencies provide directions for designing learning experiences and assignments that will help students gain practice in using and applying these competencies in different contexts.

A major challenge for faculty, staff, and administrators is to ascertain the "data ramifications" that ensure that competencies are both valid and reliable with the ultimate aim, in practice, being that they are fully transportable between and outside of postsecondary entities. Data ramifications also refer to efforts to describe competencies in a uniform manner so that they can have the same meaning in a variety of contexts and for a variety of audiences. If competencies are to be utilitarian, strategies must be built to ensure that they are uniform. It is this standardization of terminology and semantics that can lead to the transportability of competencies among sectors of postsecondary education and across organizations that are not immediately aligned with colleges and universities.

Disappointingly, few sites in this study were actively dealing with issues of reliability and validity. Instead, as might be expected of relatively new endeavors, issues of process and internal acceptance for competencies were the initial focus taking time, energy, and resources that might otherwise (with greater experience) be used to tackle transportability. In the future, as organizations and postsecondary institutions gain more experience with competency-based initiatives, a focus on data ramifications will be important. By attending to concerns about validity and reliability, institutions can glean meaningful information to improve their initiatives and to satisfy external demands for accountability.

Competencies are crucial for students before, during, and after their attendance at postsecondary institutions. Consequently, these points in time were chosen as the organizing framework for this work* as shown in exhibit E-1. This project examined how competencies were used in various settings (including eight case studies of postsecondary institutions and a corporation) at key points in a student's education.

The ultimate goal of this project was to produce a final report that could serve as a hands-on resource for practitioners who seek to develop, implement, or refine their competency-based initiative. Accordingly, the case studies and the expertise of the Working Group were drawn upon to synthesize and recommend the following principles for practice in postsecondary education. While each case study yielded fruitful insights, there are common practices gleaned from this study that can enhance the likelihood of success for those wishing to embark on competency-based initiatives.

- A senior administrator is the public advocate, leader, and facilitator for creating an institutional culture that is open to change, willing to take risks, and fosters innovations by providing real incentives for participants.

- The appropriate stakeholders fully participate in identifying, defining, and reaching a consensus about important competencies.

- Competencies are clearly defined, understood, and accepted by relevant stakeholders.

- Competencies are defined at a sufficient level of specificity that they can be assessed.

- Multiple assessments of competencies provide useful and meaningful information that is relevant to decision-making or policy-development contexts.

- Faculty and staff fully participate in making decisions about the strongest assessment instruments that will measure their specific competencies.

- The precision, reliability, validity, credibility, and costs are all considered and examined in making selections about the best commercially developed assessments and/or locally developed approaches.

---

* This temporal sequence complements the "across provider" framework offered by the National Postsecondary Education Cooperative Working Group on Student Transitions. That framework examines student movement across multiple providers and assumes that competencies are adding value as a transportable unit.

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Exhibit E-1.—Framework for organizing competency-based initiatives

Key transition	Institutions and organizations							
	King's College	Northwest Missouri State University	Sinclair Community College	Hagerstown Community College (National Science Foundation Consortium)	Colorado Community Colleges Incumbent Worker Project	Western Governors University	Proficiency-based Admission Standards System (PASS) in Oregon	Ford Motor Company
Entry into postsecondary education (PSE)								
• Competency-based secondary school graduation							X	
• Competency-based admissions							X	
Within PSE								
• Competency-based curricula in specific disciplines	X	X	X	X	X	X		
• General education competencies	X	X						
• Competencies at transfer (within providers)		X						
• Competencies at transfer (across providers)		X						
• Competencies certified through standardized tests								

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Exhibit E-1.—Framework for organizing competency-based initiatives (continued)

Key transition	Institutions and organizations							
	King's College	Northwest Missouri State University	Sinclair Community College	Hagerstown Community College (National Science Foundation Consortium)	Colorado Community Colleges Incumbent Worker Project	Western Governors University	Proficiency-based Admission Standards System (PASS) in Oregon	Ford Motor Company
Exit from PSE								
• End of program competencies	X	X				X		
• PSE to employment competencies								
Overall institutional effectiveness								
• Internal (improvements in student learning and academic programs)	X	X						
• External (accountability, performance budgeting, accreditation)		X						

- The competency-based educational initiative is embedded within a larger institutional planning process.
- The assessments of competencies are directly linked with the goals of the learning experience.
- The assessment results are used in making critical decisions about strategies to improve student learning.
- The assessment results are clear and reported in a meaningful way so that all relevant stakeholders fully understand the findings.
- The institution experiments with new ways to document students' mastery of competencies that supplement the traditional transcript.

Each principle is more fully delineated in section 4 and accompanied by illustrations from specific case studies. Research into competencies has not been reported extensively in the higher education literature. Nevertheless, there are useful and thoughtful resources about how to implement competencies. Examples of recent literature are annotated and presented in the bibliography in section 6.

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1. INTRODUCTION

A competency is a combination of skills, abilities, and knowledge needed to perform a specific task in a given context.

In 1997, a National Postsecondary Education Cooperative (NPEC) Working Group examining data needs related to workforce development policies noted an increased interest nationally in skill standards, competency-based credentials, and assessment of work-based learning experiences. NPEC's mission is "to promote quality, comparability and utility of postsecondary data and information that support policy development" (Public Law 103-382, Section 410, Improving America's Schools Act of 1994). This Working Group recommended the establishment of a NPEC project that would look at these emerging trends from the context of data and data ramifications. Advances in educational technology making access to competency-based learning more prevalent combined with competition from groups other than traditional postsecondary providers accelerated interest in this topic. In this context, performance-based learning has gained increasing attention.

There are numerous challenges associated with developing and assessing competency-based initiatives based upon performance standards. Faculty and staff must decide upon the competencies to examine and levels of performance. They deliberate about the best methodologies to assess student performance, including whether to use locally developed instruments or commercially available standardized tests. They decide who will be responsible for assessments and how the results will be used. It is not clear how problems related to portability of competency assessment and credentials across states and institutions will be resolved. These issues have ramifications for new data priorities as states, educational institutions, and training providers encounter uncharted territory in developing performance standards and assessing competencies.

A number of states and institutions are currently supporting competency-based initiatives, and efforts to define critical skills have been underway for some time at the federal level, as well as under the auspices of the national testing services. Even so, there is no comprehensive source for determining the extent to which postsecondary entities are engaged in competency-based initiatives and the extent that issues of transportability across a wide spread of providers are playing into that work. At its meeting in January 1998, the NPEC Steering Committee approved a new Working Group and asked it "to analyze current practices in defining and assessing learner competencies and to determine their utility across a range of contexts." The key tasks assigned to the Working Group were to:

- Address the current state of the use of competencies across postsecondary education;
- Investigate and report the data ramifications of competency-based initiatives in postsecondary institutions and their connections to student learning;
- Demonstrate the importance of competency-based initiatives in broader contexts such as economic development, technology-based instruction, and industry interests in competency certifications;
- Address terminology and definitional issues: What is a competency? How does it differ from a student outcome, skill, or ability? What is the relationship between performance, assessment, and standards?

- Reach out to important target audiences (e.g., presidents, board members, legislators) that are not likely to avail themselves of other work in the area of competency definition and assessment; and
- Establish a set of "strong principles" or key considerations in the decision-making process for defining and measuring competencies.

Members of the Working Group brought wide and focused expertise to bear on these tasks, including:

- Developing competency-based admissions processes in higher education;
- Linking skills with job requirements;
- Developing career transcripts;
- Assessing critical thinking and writing skills;
- Defining workforce development performance measures; and
- Carrying out assessments at different points in the learning process.

It should come as no surprise that these areas are ubiquitous in the wide arena of competency-based initiatives. It is very challenging to create, plan, and implement competency-based systems. In many instances, major political processes both within postsecondary education and in the external environment dictate the will to implement them and the success that they might achieve. The Working Group discussed purposes, principles, pitfalls, and processes for defining and assessing competencies within these areas, and concluded that future directions should involve an examination of the state of current practices through a case study approach. The resulting case studies form the foundation for gleaning the principles of effective practice in competency-based initiatives presented in section 8 of this document.

The Working Group also struggled with the semantically sensitive issues that are attendant to efforts in this area. For example, what is considered a "competency" in one setting may be regarded as an "objective" or "skill" in another setting. There is no single definition of a competency that cuts across all contexts, necessitating development of an operational definition to guide this project.

The Working Group also was cognizant of its relationship to other Working Groups commissioned by NPEC. By casting its definition of competency, in examining state-of-the-art practice, and in making recommendations for future practice, it is hoped that this work can inform not only NPEC but the wider postsecondary universe as well. For example, the conceptual framework, with its emphasis on times in a postsecondary education career that competencies are important, parallels the efforts of another NPEC Working Group (Student Transitions Working Group) entitled "Examination of Policy Issues and Data Needs at Points of Student Transition" (Student Transition Data Systems: Phase I Report of the NPEC Working Group, November 2000).

A Quick Roadmap to This Report

Following this introduction (section 1), the report is divided into seven sections. The following "roadmap" may aid the reader to use this document efficiently.

- **Section 2:** Provides a conceptual overview of competencies as implemented in a variety of settings, including key concepts and definitions, which can be useful as a starting point for institutions that previously have not considered competencies and their connection to the learning process.
- **Section 3:** Establishes the methodology used by the Working Group to select sites for the case study investigation. Gives practitioners a quick overview of the criteria used to determine "cutting-edge" case study locations, as well as a glimpse of key issues probed during interviews.
- **Section 4:** Provides a quick read on the overarching principles and strong practices uncovered within the case studies. Helps institutions, state agencies, and policymakers learn about how to improve or create competency-based initiatives with examples from other settings.
- **Section 5:** Outlines an agenda for future work and a call for action at the institutional level.
- **Section 6:** Offers a current, annotated bibliography of resources in the literature about competencies. Serves as a guide to the best resources for both practitioners and policymakers.
- **Section 7:** Contains abstracts of the eight case studies.
- **Section 8:** Appendices A-H present the eight case studies for those practitioners who want more details and analyses of current practices in assessing and utilizing competencies within a specific institutional or corporate context. Appendix I is the case study interview protocol.

2. DEFINING AND CLASSIFYING COMPETENCY-BASED INITIATIVES: THE GUIDING FRAMEWORK

The challenge is to determine which competencies can be bundled together to provide which types of learners the optimal combination of skills and knowledge needed to perform a specific task.

What is a competency? Why is it important to assess competencies? How are assessments of competencies used in making decisions and developing policy? The Working Group's deliberations on these topics are presented in this section. The Working Group relied upon the wide range of experiences reflected in its membership to develop a first-cut definition of the scope of competency-based initiatives and used that pragmatically derived definition to guide the compilation of an annotated bibliography of competency-based initiatives.

The world grows more complex on a daily basis as knowledge increases dramatically each year, and access to learning opportunities is greater now than at any previous time. Information technology has expanded learning paths that do not lead solely to postsecondary institutions. The interest in learning "anywhere, anyplace, anytime" means that traditional educational delivery systems will be challenged to address the needs of diverse learners. Along with expanded access, potential students and undergraduates will likely become more sophisticated consumers and will grasp the concept of acquiring skills and competencies through diverse means. The Wingspread Group on Higher Education (1993, p. 14) noted that, "putting learning at the heart of the academic enterprise will mean overhauling the conceptual, procedural, curricular, and other architecture of postsecondary education on most campuses." This report is not intended, by itself, to change the culture of most postsecondary institutions. However, it can offer guideposts and examples of good practice for those institutions and entities that want to become more fully engaged in performance-based learning. Ultimately, the process of implementing competencies can be a valuable lever for creating new opportunities and collaborations among postsecondary institutions and other organizations.

The case study findings reported here explore the beginning work of several initiatives that are in the early stages of development. A couple of sites have more extensive experience. Collectively, the studies provide strong evidence that most competency-based initiatives are at the embryonic stage of development across postsecondary education in the United States. In contrast, Great Britain has created a skills system under the auspices of the National Learning and Skills Council (Betts and Smith, 1998). The Council operates through 47 local Learning and Skills Councils and is supported by over 100 local Learning Partnerships. Whereas the early returns from this experience indicate that this system is somewhat inflexible and perhaps not as immediately responsive to marketplace needs as it might be, its establishment at least provides the foundation for the transportability of skills across sectors. It is not clear whether the recent push toward competency-based initiatives on behalf of a handful of institutions in the United States will ever approach a national system similar to Great Britain's. The current architecture of higher education in the United States does not easily promote the open exchange of learner competencies across sectors (e.g., from community colleges to 4-year institutions across states). In the meanwhile, institutions and students are often left to navigate issues of transportability of learning experiences in uncharted waters.

During initial meetings, the Working Group utilized its collective experiences and reviewed an initial draft of a bibliography prepared by Karen Paulson, consultant to the Working Group. The Working Group then developed a framework for classifying competency initiatives. This

framework consists of four major stages where competencies are important: (1) entry into postsecondary education, (2) points of transition within postsecondary education, (3) exit from postsecondary education, and (4) the overall effectiveness of postsecondary education. These elements provide a broad framework (as outlined below) for conceptualizing competency-based initiatives both within and outside of postsecondary institutions. The Working Group identified a subset of these elements for further examination through case studies.

Entry Into Postsecondary Education

- Competency-Based Secondary School Graduation
- Competency-Based Certification of Skill Attainment
- Competency-Based Admissions to Postsecondary Institutions
- Competency-Based Placement in Classes
- Competency-Based Military Experiences

Within Postsecondary Education

- Competency-Based Curricula in Specific Disciplines
- General Education Competencies
- Competencies at Transfer Within a Single Postsecondary Education Provider (e.g., change of majors or program of study)
- Competencies at Transfer Across Multiple Postsecondary Education Providers (e.g., from one institution to another)
- Competencies Certified Through Standardized Testing

Exit From Postsecondary Education

- End of Program Competencies
- Postsecondary to Employment (Workplace Competencies: Demonstrations on the Job)
- Postsecondary to Employment Eligibility (Licensures, Certifications, or Board Examinations)
- Postsecondary to Graduate/Professional School
- Lifelong Learning

Overall Institutional Effectiveness

- Internal (Improvements in Student Learning and Academic Programs)
- External (Accountability, Performance Budgeting, Accreditation)

This framework was used as the basic classification structure for the annotated bibliography and for selecting the limited number of competency-based initiatives to study. This structure also is useful for defining links across the activities carried out within the project and ultimately among the products resulting from this work. This structure also parallels the work of the NPEC Working Group on Student Transitions.[1] This particular NPEC Working Group represents a similar effort to understand learner mobility. Both groups endorse the premise that learning pathways from school to college and to work can no longer be defined in terms of highly structured, linear patterns and timeframes. Rather, learners (during the course of a lifetime) are likely to pursue many different transitions between learning experiences and work, and between further training and additional education. Gaining insights into these transitions is important so that the documentation of learning (via competencies) can lead to smoother student transitions within and outside of postsecondary education.

Key Concepts and Definitions

Many terms are used interchangeably to describe learners and the results of the learning process, including outcomes, skills, traits, characteristics, competencies, and domains. Although the boundaries and meanings among these words are frequently blurred, a clear definition of what is meant by competency is needed to guide this work. The ultimate definition of competency as used by the Working Group and throughout this document is the combination of skills, abilities, and knowledge needed to perform a specific task. Figure 1 was adopted to provide demarcation among terms and to assist others to visually differentiate the hierarchy chosen by the Working Group.

- **Traits and Characteristics** are the foundation for learning, the innate make-up of individuals on which further experiences can be built. Differences in traits and characteristics help explain why people pursue different learning experiences and acquire different levels and kinds of knowledge and skills.
- **Skills, Abilities, and Knowledge** are developed through learning experiences, broadly defined to include school, work, participation in community affairs, etc. (although the Competency-Based Initiatives project is focusing on formally organized postsecondary education learning processes).
- **Competencies** are the result of integrative learning experiences in which skills, abilities, and knowledge interact to form bundles that have currency in relation to the task for which they are assembled.
- **Demonstrations** are the results of applying competencies. It is at this level that performance can be assessed.

[1] For more information on the Student Transitions Working Group, as well as the other NPEC initiatives, visit the NPEC Web Site at http://nces.ed.gov/npec/projects.asp

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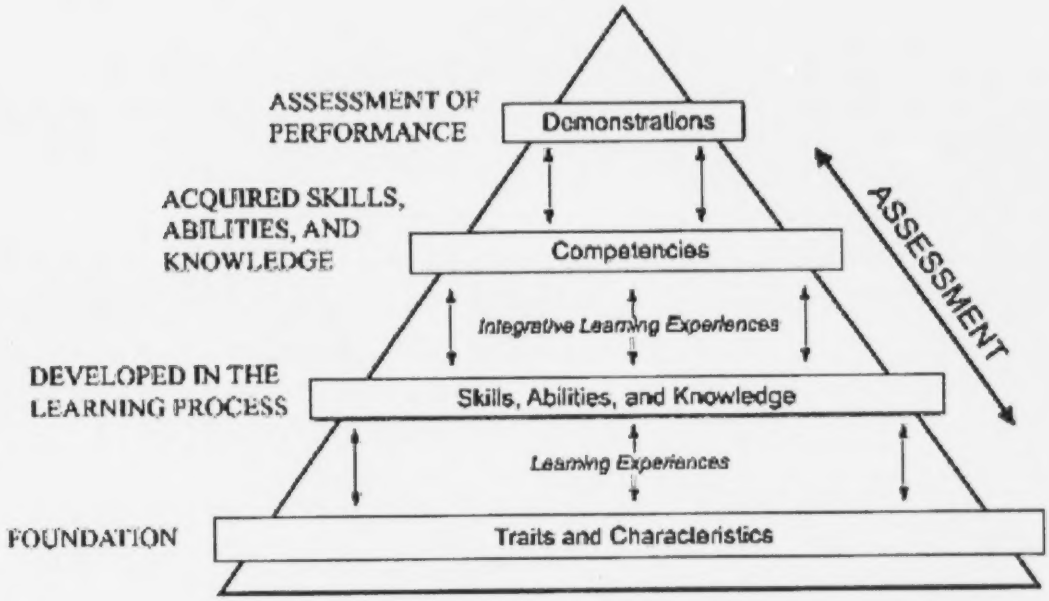
Figure 1.—A hierarchy of postsecondary outcomes



Characteristics of Competencies

Skills, abilities, knowledge, and competencies are often used interchangeably by those within and outside of postsecondary education. For example, we speak of competent machinists and highly skilled machinists; competent mathematicians and knowledgeable mathematicians. The hierarchy in figure 1 seeks to differentiate these terms: skills and knowledge are acquired through learning experiences; different combinations of skills and knowledge that one has acquired define the competencies that an individual possesses. Finally, different combinations of competencies possessed by an individual are combined in carrying out different demonstrations or tasks.

Administrators, faculty, and policymakers frequently use the term "outcomes of postsecondary education." At a basic level, such language would seem to encompass the skills and knowledge acquired in the learning process. However, and perhaps because of its wide usage in a variety of contexts, the term also includes, for many, psychosocial development; attitudes, values and beliefs; and civic development (see, for example, table 2: A Taxonomy of Student Outcomes, U.S. Department of Education, 1997.) Widely used, the term "outcomes" also encompasses proxies for skills, knowledge, and abilities, including the completion of a degree or course, grades, certifications, employment, and salary. Each of these signposts is measurable, attributable in varying degrees to postsecondary experiences, and time-linked. A fuller scope of postsecondary outcomes is directly related across an individual's lifespan, including better health and the economic benefits passed on to his/her children.

In this view, then, competencies are complementary phenomena. They are a combination of skills, abilities, and knowledge. Knowledge of the relationship between voltage, resistance, and amperage (i.e., knowledge of Ohm's Law, whether put in those terms or not) and skills in soldering and splicing wires are among those needed to be a competent electrician. These

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competencies can lead to certification and eventual employment. They also can contribute to a broader set of postsecondary outcomes, including economic return to self and society.

A single competency can be used in many different ways. For example, measuring distances is important to both professional golfers and surveyors. Of course, different measuring skills may be involved in carrying out these two tasks, but the skill involved in performing measurement, irrespective of technique or method, should produce the same result. It is in their context, however, that competencies have their greatest utility.

Competencies within different contexts require different bundles of skills and knowledge. It is precisely this "bundling" and "unbundling" that drives competency-based initiatives among postsecondary entities. The challenge is to determine which competencies can be bundled together to provide which types of learners the optimal combination of skills and knowledge needed to perform a specific task. Leadership in a surgery suite is different from leadership on the basketball court. For example, motivating teammates is more important to leadership in basketball, while superior knowledge of the procedure is more important to leadership in surgery. In both contexts, however, an ability to effectively coordinate the roles, timing, and contributions of coworkers is critical. The bundles of different skills and knowledge that are given the same label in different contexts is one reason there is often difficulty in achieving a common understanding of what a given competency (like leadership) is, and then what it means to assess it.

Knowing how to package the right set of competencies to effectively carry out a given task is in itself a competency. We sometimes refer to individuals as having great skills, but these same people appear unable to apply them. With experience and experimentation, people combine gestures, phrases, eye contact, pace of speech, etc., in ways that allow them to give better speeches. It is easy to see that maturation, motivation, and opportunities to practice are keys to understanding the bundling and unbundling processes.

Using Competencies[2]

Competency-based initiatives seek to insure that students attain specific skills, knowledge, and abilities considered important with respect to whatever they are studying or the transitions for which they are preparing. Utilizing competencies requires the development of three distinct, but interactive components:

- A description of the competency;
- A means of measuring or assessing the competency; and
- A standard by which someone is judged to be competent.

The following examples illustrate these components in selected areas within the study's classification structure:

[2] This section draws heavily upon a communication to the Working Group from Joy McClarty, former member of the NPEC Competency-Based Initiatives, in March 1999.

Entry into postsecondary education (competency-based admissions)

- Defining competencies: often done by curriculum panels of faculty and teachers;
- Assessing competencies: multiple methods are used, including standardized tests, teacher ratings using their own scoring guides, and evaluations of student work samples or portfolios; and
- Standards for judging competence: often set by a master panel of secondary and postsecondary faculty.

Exit from postsecondary education—postsecondary education to employment (certification and licensure)

- Defining competencies: usually done by members of the profession with a "public protection" perspective;
- Assessing competencies: various methods used including licensing exams, completion of accredited programs, and successful experience in specified levels of practice; and
- Standards for judging competence: established in practice, laws, or certifications that have credibility with employers.

Competency-based initiatives can be important in communicating to students which competencies are important for them to attain and the extent to which their learning experiences/efforts are meeting these expectations (i.e., the student as a consumer of information about competencies).

Competency-based initiatives also can be important in communicating to employers or the general public what people know and are able to do. Thus, a primary advantage of using competency definitions, assessments, and standards is the process of identifying which competencies are important for students to attain, and the quality assurance that students actually attain them.

When issues of transporting competencies arise, it is even more critical that they be described both qualitatively and quantitatively in a common language set. It is in this domain that the Working Group devoted considerable energy. Difficulties are created for students and providers when they use the same term for different competencies; or conversely, when different standards for assessing the same competencies are employed. Both undermine efforts to develop a common language and subsequently the utility of competency-based initiatives as a means of communicating with students, employers, and the general public. Unfortunately, there is currently no common, utilitarian rubric other than the framework offered in this final report that can address the tendency by providers and other groups to develop their own definitions and subsequent standards for assessing competencies. Lack of national consensus on definitions and standards by which competencies can be judged impedes their ultimate transportability across a variety of contexts.

Data Ramifications of Competency-Based Initiatives

What separates this work from other efforts to understand competencies and their position in the constellation of postsecondary education? The charge to the Working Group was "to analyze current practices in defining and assessing learner competencies and to determine their utility across a range of contexts." It is this last word, "utility," that serves as a demarcation point for this project, underscoring the need to understand the data ramifications of competencies for administrators, policymakers, and postsecondary institutions.

What are data ramifications and why should anyone care? This topic invites memories of graduate programs in statistics, where data and decisions about data are paramount. How can data be tied to competencies, or what do numbers have in common with outcomes, skills, attributes, and objectives? Beyond the numerical realm and in a broad sense, the term "data ramifications" refers to efforts to describe competencies in a uniform manner so that they have the same meaning in a variety of contexts. It is this standardization of terminology and semantics that can lead to the transportability of competencies across different levels of education among postsecondary entities and external stakeholders such as employers.

The statistical concepts most aligned with data ramifications in this arena, especially in considering the transportability of competencies, are reliability and validity. For reliability, faculty and policymakers are interested in whether a measurement technique, applied repeatedly and across the same subjects, will yield the same result each time. For institutions, this becomes an issue of quality control in choosing whether to bundle or unbundle a competency earned or certified by another provider.

The concept of validity strikes somewhat deeper meaning in an assessment context. That is, the main concern is whether the measure of a competency really reflects the true meaning of that competency. At a surface level, this is referred to as "face validity." That is, does the measurement of a competency reasonably have anything to do with the understanding of that competency. In a more direct way, we also refer to "predictive validity," or referencing an assessment to an external criterion such as admission to college or success as a tool and die operator. "Content validity," in contrast, refers to whether an assessment is sufficiently inclusive of the competency at hand. For example, a mathematical computation competency test should not stop with just addition, but should also include subtraction, multiplication, and division. Finally, "construct validity" refers to the way in which an assessment or measure relates to other variables within a system of theoretical relationships. For instance, there might be interest in how a measure relates to "overall undergraduate satisfaction."

It is important to determine the validity and reliability of both formative and summative assessments. Faculty and staff typically conduct formative assessments during the life of an academic program. The main purpose is to provide feedback to stakeholders that can be used in making key decisions about the best way to modify, shape, and ultimately improve the academic program and student learning (Palumbo and Banta, 1999). If competencies are clear, meaningful, and fully understood by relevant stakeholders, there is greater likelihood that linkages across academic programs and even across institutions within a state or consortium can be created. Such linkages create smoother transitions for students who move between institutions and also provide greater coherence in the curriculum. If stakeholders are satisfied with the levels of reliability and validity of the assessment methods as they review results, then such approaches will have greater credibility as students seek to get appropriate courses waived or receive academic credit for previous learning experiences.

Data ramifications are also directly aligned with external demands for accountability. Faculty and staff typically respond by implementing summative assessments. The assessment results are reviewed by multiple audiences and used to make judgments about the quality or worth compared to previously defined standards for performance (Palumbo and Banta, 1999). During the 1990s, the attention of regional and professional accrediting associations turned to assessment of student learning. They require their members to have written assessment plans in place that can be periodically reviewed by accreditation teams. A focus on the data ramifications of competency-based initiatives, especially reliability and validity of competencies, can provide a basis for assessing student learning in line with expectations for continued accreditation.

A central task for the Working Group and consultants, then, was to create a protocol for the case studies that would examine whether the concepts of reliability and validity were a concern. This protocol would also examine how, and if, these concepts were addressed in an operational and conceptual sense. The extent to which issues of reliability and validity are addressed affects transportability and plays a central role in shaping the data ramifications for a given initiative.

The findings from these case studies will most likely be disappointing to those readers who wish to plumb the depths of data ramifications of competency-based initiatives. When they were examined, disappointingly few sites were actively dealing with issues of reliability and validity. Instead, as might be expected in some cases of relatively new endeavors, issues of planning, process, and internal acceptance for competencies took considerable time, energy, and resources that might otherwise be devoted to tackle transportability. One might expect that these case study sites may be unaware of other initiatives explored in this study and are connected only through this report. They do not share a common agenda for determining reliability and validity. Nonetheless, the reader can gain a sense of why data ramifications are addressed in some settings and not in others by reading the individual case studies.

3. METHODOLOGY FOR THE CASE STUDIES

Multiple case studies that demonstrate exemplary competency-based initiatives are selected for in-depth study to identify their strong practices.

This section presents a brief overview of the research methodology used to address the project's goals. Initial discussions of the Working Group were guided by the creation of an annotated bibliography of selected resources about competency-based initiatives. This bibliography informed the selection of specific cases that fit into and addressed at least one major component of the framework. This framework (as outlined in section 2) provided an organizing structure to classify learning experiences prior to postsecondary education, during postsecondary education, and then exiting from postsecondary education or graduation as well as overall institutional effectiveness. An interview protocol was developed by consultants and guided all formal meetings with selected participants at each particular site. All data gathered from this project were analyzed to produce the project's major findings. The major themes and important principles, entitled "strong practices" in this report, were found to cut across several cases as outlined in section 4.

Annotated Bibliography

Project consultants prepared an annotated bibliography (section 6) that provides a sample of competency-based initiatives that are encompassed by the classification framework developed by the Working Group. The bibliography is neither exhaustive nor comprehensive; rather, it was designed to provide illustrations of work completed on the points of transitions reflected in the classification framework. It was also intended to capture samples of how competencies are defined and measured.

This bibliography provided insights about particular issues associated with the development, implementation, and assessment of competencies. It also provided directions for the identification and selection of several strong case studies.

Selection of Specific Case Study Sites

The Working Group identified potential case study sites that address at least one area of the framework for classifying competency-based initiatives. In addition, they wanted to examine institutions or corporate sites that (1) introduced students/employees to the competencies to be developed, (2) provided multiple opportunities for the competencies to be learned, and (3) assessed students/employees throughout their learning experiences. As the Working Group considered potential sites, they decided it would be best to select cases that have not been studied in depth by other researchers. For example, the Working Group decided that Alverno College is well known for its high-quality competency-based work, but they believed that it has been studied extensively and is well documented elsewhere in the literature. The Working Group ultimately selected institutions (community colleges, universities, and a corporation) that had either strong competency-based initiatives already in place or were developing ambitious programs that could influence postsecondary education. The sites listed in exhibit 1 were part of this study and address at least one key transition point related with postsecondary education and competency-based programs.

Exhibit 1.—Framework for organizing competency-based initiatives

Key transition	Institutions and organizations							
	King's College	Northwest Missouri State University	Sinclair Community College	Hagerstown Community College (National Science Foundation Consortium)	Colorado Community Colleges Incumbent Worker Project	Western Governors University	Proficiency-based Admission Standards System (PASS) in Oregon	Ford Motor Company
Entry into postsecondary education (PSE)								
• Competency-based secondary school graduation							X	
• Competency-based admissions							X	
Within PSE								
• Competency-based curricula in specific disciplines	X	X	X	X	X	X		
• General education competencies	X	X						
• Competencies at transfer (within providers)		X						
• Competencies at transfer (across providers)		X						
• Competencies certified through standardized tests								

Exhibit 1.—Framework for organizing competency-based initiatives (continued)

Key transition	Institutions and organizations							
	King's College	Northwest Missouri State University	Sinclair Community College	Hagerstown Community College (National Science Foundation Consortium)	Colorado Community Colleges Incumbent Worker Project	Western Governors University	Proficiency-based Admission Standards System (PASS) in Oregon	Ford Motor Company
Exit from PSE								
• End of program competencies	X	X				X		
• PSE to employment competencies								
Overall institutional effectiveness								
• Internal (improvements in student learning and academic programs)	X	X						
• External (accountability, performance budgeting, accreditation)		X						

These cases represent two very different ends of the continuum in terms of their own development and levels of experience. The institutions in one group (e.g., King's College, Northwest Missouri State University, and Ford Motor Company) typically have more than 10 years of experience with competency-based initiatives. Therefore, the development, implementation, and assessment of competencies have been integrated across their entire educational system. This means that competencies typically cut across all of their programs. For most institutions in this group, there are some preliminary findings about data ramifications, including reliability and validity.

The other set of cases represents organizations (e.g., Western Governors University, Colorado Incumbent Worker Project, Hagerstown Community College—The National Science Foundation-funded College Consortium, and Proficiency-based Admission Standards System in Oregon) that are in the early stages of development and planning. They have not reached full implementation that includes assessments of student learning. These particular cases comprise groups of institutions working together toward major reforms that may be more time-consuming than those individual institutions with a long history of reform. Since these particular cases are in the early stages of development work on their competency-based educational initiatives, there is very limited information about data ramifications, and in some situations, there is no information available at the time of this work that addresses reliability and validity issues. The main focus of these partnerships is on their plans. The Working Group strongly believed this second set of cases was very important to examine at this time since they are ambitious and have great potential to influence postsecondary education.

Interview Protocols

The consultants developed an interview protocol that was evaluated and approved by the Working Group. The instrument served as a guide for all interviews. The protocol focused specifically on the areas outlined below, and for each specific topic, additional probing questions were pursued (see appendix I).

- Explaining why a competency-based model was selected;
- Describing how the competencies are used;
- Outlining how the competencies were developed;
- Identifying who provided leadership for the development of these competencies;
- Addressing how reliability and validity of competencies are ensured;
- Identifying how competencies are assessed or measured;
- Highlighting challenges and successes in development, implementation, and assessment of competencies;
- Determining if the competencies are transportable; and
- Outlining important advice for other college and university faculty, researchers, and administrators who may be interested in implementing a competency-based model.

The Working Group particularly wanted an emphasis on data and their ramifications. These points were gleaned from responses to the questions regarding the process of establishing

competencies and their assessment. Some interview questions focused upon the reliability and validity of competencies, as well as the assessment methods and results.

Interview Participants

For each case study, an institutional liaison (who provided leadership at the organization) identified the appropriate individuals to interview. For most cases, the consultants visited each site and interviewed 5 to 18 individuals. The participants frequently were faculty representing different disciplines and key administrators (including directors of assessment). These individuals often participated in the development, implementation, and assessment of the competencies. Most interviews lasted about 45 to 60 minutes.

The Working Group consultants also collected relevant documents and materials that provided additional insights about the specific competency-based initiative. These materials often included college catalogues, strategic or assessment plans, and selected assessment instruments.

Analysis

The Working Group consultants analyzed the results for each question by identifying the major themes across the participants' responses to questions within a single case. Individual case studies were then created and are abstracted in section 7; complete case study reports are provided in section 8.

The Working Group consultant and members also analyzed the results by examining common themes across the case studies. Although a wide variety of initiatives was studied, there were frequently common issues. In addition, certain case studies portrayed strong practices in the development, implementation, and assessment of competencies. For this reason, the next section focuses on a cross-site analysis and articulates the most effective practices found among the sites.

4. PRINCIPLES OF STRONG PRACTICE

Strong competency-based initiatives produce meaningful assessment results that are used in making critical decisions about ways to improve student learning.

This section presents a cross-site analysis to facilitate a better understanding of common, strong practices. These strong practices are discussed in this section so that faculty and administrators can decide how these strategies can be adapted at their own college or university. These practices also suggest key considerations and processes that should be reflected upon as groups of faculty, administrators, or corporate leaders decide whether to implement competency-based models within their own organizations.

Strong practices are clustered together under four main categories:

- Planning for competency-based education initiatives;
- Selecting assessment methods;
- Creating and ensuring that learning experiences lead to competencies; and
- Reviewing assessment results to identify changes needed to strengthen student learning.

Most faculty and staff begin by identifying and defining important competencies for their own students. During this stage, they usually seek feedback from their stakeholders. Once this work is completed, faculty and staff review and select assessment methods or measures that are linked with the specific competencies that have been defined. Strong, multiple assessments provide faculty, staff, and administrators with meaningful information about whether students are mastering the important competencies and what levels of performance they have achieved. Faculty also strive to embed these competencies within courses, programs, and across the institution's academic programs. Often faculty and staff use formal documentation methods (common to all programs) that outline the specific courses where students will learn about these competencies and how they will be addressed in terms of the design of learning experiences. Finally, once faculty and staff have completed initial assessments of student learning, they can begin to evaluate the data itself, whether there are certain areas of student learning that need to be improved, and where students demonstrate strong skills.

Each principle derived from the case studies will be discussed, and appropriate references will be made only to institutions that were part of this research. One limitation of this approach is that only the particular case studies (examined in this research) that demonstrate strong practices will be referenced. There are other colleges and universities that already adhere to these practices (such as Alverno College), but since they were not part of this research study, they are not cited. The strong practices presented in this report were derived solely from the institutions and entities selected by the Working Group. Another limitation is that institutions have substantially varying levels of experience with competencies based upon the number of years that they have been working toward their own implementation and assessment. Some institutions have a long history of work (more than 10 years) with competency-based curricula, while other sites are in the early stages of developing and planning for their initiatives.

The accumulation of all of these principles may seem overwhelming to faculty and administrators who are wondering whether to create a competency-based system. However, readers are advised to remember that institutions with the strongest practices have been working at this for many years. Perhaps one of the greatest overriding lessons learned is to provide sufficient amounts of time and guidance to help faculty develop, implement, and evaluate their competency-based educational initiative.

Planning for a Competency-Based Educational Initiative

When the case studies are examined as a group, important strategies emerge that help sustain the initiative over time. Academic leaders, faculty, and staff follow these key principles (outlined in this section) in the planning process. All principles listed below are equally important, and the numbering does not indicate any type of rank ordering.

The Planning Process: Strong Principle for Academic Leaders

Principle #1: A senior academic administrator becomes the public advocate, leader, and facilitator for creating an institutional culture that is open to change, willing to take risks, and fosters innovations by providing real incentives for participants.

- Encourage faculty and staff to conceptualize and implement changes in an incremental manner;
- Provide sufficient amount of time and support to enable participants to fully reflect upon potential competencies, conduct formal research to identify the most important competencies, and reach consensus;
- Give faculty and staff sufficient training and development opportunities to learn how to identify and define competencies; and
- Analyze realistically budget needs and insure adequate resources are provided to develop competency-based initiatives.

At most sites in this study, there was a key institutional leader who was perceived as the major visionary guiding faculty to consider how to develop a competency-based curriculum. Often a senior academic administrator met regularly with faculty leaders and relevant committees in an effort to structure how decisions would be made about transforming the curriculum into a competency-based model. Faculty and staff who participated fully in this change process often viewed their senior administrator as an individual who possessed the important leadership skills to build an environment of trust across the campus. This academic leader fostered ongoing and open communications with all relevant stakeholder groups. Faculty, staff, and administrators typically worked as partners in a collaborative process. Since these leaders placed an emphasis on a participatory process, most faculty felt ownership for the curriculum change and fully endorsed it.

The senior leader was fully committed to change since he or she provided real incentives to encourage innovation and support for the participants. Incentives for participation included effective, meaningful strategies to address the demands upon faculty time. Some professors were released from teaching a course in their regular load or they were paid stipends to participate and work on their initiatives in the summer. They also could receive support from an undergraduate or graduate student who was paid to work with them. Additional incentives included resources to attend professional conferences or to purchase necessary equipment. However, for faculty, the most important issue was their time. Therefore, the most meaningful incentives seemed to be those strategies that helped them to work effectively within their busy schedules and manage multiple priorities within reasonable amounts of time.

These incentives typically cost money and require an academic leader to develop a realistic budget that will cover important expenses. In addition to incentives, there will be more start-up costs that an academic leader will need to analyze and account for in order to build a strong competency-based initiative.

If change is introduced quickly and expected to affect the entire system simultaneously, then there is an increased likelihood that the initiative may face major challenges and not be sustained over time. A senior academic leader often encouraged incremental steps over time that eventually led to more comprehensive change across the whole system. For example, at King's College, faculty and staff endorsed building a competency-based curriculum. Faculty identified the important competencies that should be a foundation for all programs. However, they decided to begin with the articulation of critical thinking competencies across the curriculum before proceeding to define and expect other important skills to be embedded across learning experiences (including both general education and all academic major programs). Such a strategy increases the likelihood that the initiative can be sustained over time.

Large changes were broken into smaller, more manageable steps that could occur and build over time. In addition, faculty and staff were encouraged to pilot test their innovations so that they could determine what was working and what could be improved. Faculty seemed to feel less threatened and more confident by knowing that they could try new ideas that might not succeed without serious consequences. The academic leaders typically believed that even if a pilot did not fully succeed, at least faculty and staff had attempted new ideas and could learn what should be changed or revised the next time they implemented their ideas. Finally, academic leaders encouraged faculty to take sufficient amounts of time to develop their ideas. For example, the consortium of community colleges spearheaded by the Johns Hopkins University spent a full year working with faculty and employers to identify and define the important competencies for their programs and courses. Participants in the Western Governors University also found that it took a full year to identify and define competencies. Although it may be tempting to rush forward with this process, academic leaders found that adequate time is very important in building a stronger curriculum. Spending a full year on defining and identifying competencies was typical since these are frequently new concepts for faculty and staff who have not investigated the needs of employers or other relevant stakeholder groups.

Another critical and necessary element was the creation of strong faculty development programs so that participants can learn how to identify and define competencies. Faculty and staff are often open to new ideas but have not learned through their graduate studies about how to define specific competencies that can actually be assessed. Faculty development initiatives usually rely on a combination of internal experts and external consultants who work with faculty on designing their course and program plans. Through a series of planned workshops often convened during

the summer, faculty and staff get time to focus their attention on redesigning their courses. Such formal workshops allow faculty and staff to experiment with new ideas, then they receive informed advice from experts about how they might strengthen their definitions of competencies. These workshops are usually offered on a regular, consistent basis with followup discussions and meetings rather than a single event. Followup meetings and ongoing workshops are important to reinforce the ideas of faculty and staff and allow for meaningful revisions over time.

The Planning Process: Strong Principles for Faculty and Staff

Principle #2: The appropriate stakeholders fully participate in identifying, defining, and reaching a consensus about important competencies.

- Review existing, relevant information about important competencies and either adopt or tailor own competencies based upon multiple resources;
- Develop formal process for identifying and defining competencies that is credible to key stakeholders (students, faculty, employers, and policymakers);
- Set standards or criteria that indicate the required levels of performance; and
- Share relevant information about specific definitions of competencies, how they were identified, and the standards associated with adequate mastery with appropriate stakeholders.

Principle #3: Competencies are defined at a sufficient level of specificity that they can be assessed.

- Define multiple competencies that capture progressively more advanced knowledge and skills; and
- Target both content (knowledge) as well as generic and process skills (such as writing or oral communication).

Principle #4: Competencies are clearly defined, understood, and accepted by relevant stakeholders.

Across several of the case studies, faculty and staff began to re-evaluate their own curriculum because they were dissatisfied with the existing version. Faculty often believed that some students were not well prepared upon graduation and lacked the necessary skills and abilities to perform at a high level in the workplace and in society. Faculty also stressed that their curriculum lacked coherence and that students would take courses from a fragmented, piecemeal set of learning experiences. Without meaningful coherence that would unite courses and

programs with some common goals, faculty thought that students were completing an education based upon individual learning experiences that did not necessarily help students reach their full potential. Typically in the older versions of their curriculum, faculty had not identified the essential, specific competencies that students should achieve, nor did they build coherence across learning experiences.

When dissatisfaction reached a peak with the old curriculum, then faculty began to review their curriculum formally and moved toward identifying and articulating relevant and current competencies that students would need to be effective in the real world. Initially, faculty often reviewed multiple, external sources of information about relevant competencies before they began their own decision-making process. Sometimes faculty were influenced by professional accreditation requirements or their own professional organizations (such as the American Accounting Association). Such organizations typically articulated extensive lists of relevant competencies that faculty groups would review and consider. The Secretary's Commission on Achieving Necessary Skills[3] (SCANS, 1992) was another resource that community college participants frequently considered, as were occupational skills standards and other industry specifications about important competencies.

Once faculty have identified and reviewed relevant, potential competencies, they must determine the best strategy for getting formal feedback from their own constituencies. Potential participants include the faculty, alumni, current undergraduate students, and employers who hire the program's or institution's graduates. These formal strategies to identify the relevant competencies are typically research-based and require a systematic analysis of results in order for the information to be meaningful, useful, and valid. While it may be tempting to make decisions about competencies by using intuition—one's own experience, imitation, or random discussion—faculty in these case studies tended to interview or to survey relevant stakeholder groups. Some faculty leaders used both strategies. The Johns Hopkins University-led consortium of community colleges initially needed to identify important competencies for their manufacturing majors. They used several sets of external resources including SCANS, an existing DACUM (Developing a Curriculum in Manufacturing) report, and the skills-setting efforts of participating industry representatives (Packer and Mathias, 1995). Then members of this consortium spent a full year using a modified DACUM process to formally gather feedback from employers (in the relevant industries) and faculty. Drawing upon the multiple resources identified above, the leaders began with a list of competencies and asked faculty and employers to identify the most important areas to focus on within the curriculum. In a similar manner, the president of Northwest Missouri State University conducted a Delphi study to identify the essential competencies that undergraduates should master to be effective in the workplace. The results from this research became the foundation for the entire curriculum and defined key quality indicators (such as communications, problem solving, and self-directed learning).

Faculty in several of these case studies began with identifying a general goal, but they also proceeded to define specific competencies that could be assessed. For example, faculty might state that they want all undergraduates to "develop effective critical thinking skills." While this goal is very important, it is open to different interpretations. Faculty might have different views on what constitutes "effective" critical thinking if they were asked to define it based upon their own individual experiences. Prior research has identified the different dimensions associated with critical thinking, including evaluation, analysis, inference, interpretation, presentation of arguments, and related dispositions (being open-minded or flexible) (Jones, 1994; Facione, 1990).

[3] This Commission was appointed by the Secretary of Labor.

The accounting faculty at King's College wanted their majors to develop strong critical thinking skills. They felt their students should be able to apply critical thinking skills in preparing and analyzing financial statements, preparing budgets, making managerial decisions, preparing audit programs, and writing audit reports. They established specific critical thinking competency statements for specific accounting courses, indicated assignments that would help students master these skills, and articulated specific assessment criteria. One abbreviated example from an advanced accounting course is shown in exhibit 2, and additional illustrations are provided in the entire case study reported in section 8.

Exhibit 2.—Abbreviated example of a competency statement*

Competency description	Strategy	Assessment criteria
The student will be able to:	Assignments:	
1. Bring together two separate financial statements of corporations under common ownership utilizing the pooling of interests and purchase methods.	Reading and reporting on articles from financial publications.	The student correctly selects, compiles, and analyzes data needed to prepare meaningful financial reports.
2. Understand the accounting alternatives and history of goodwill resulting from business combinations.	Solving problems related to various subjects on both a manual basis and spread-sheet software designed for consolidated financial statements, foreign currency remeasurements and translations, and partnership accounting.	The student prepares reports according to generally accepted accounting principles.
3. Understand the effect of globalization of business upon the reporting of business transactions, including foreign currency transactions.	Answering essay questions and solving problems.	The student identifies alternative perspectives on issues presented in various segments of the course. The student evaluates the merits and drawbacks of alternative positions, which can be chosen from competing alternatives in the various segments of class.
4. Account for various types of partnerships and the unique characteristics between partners and the partnership.		The student shall use logical reasoning throughout the course in understanding competing alternatives.

*Reprinted with permission of Donald Farmer, King's College, Wilkes-Barre, PA.

Faculty typically articulate competencies that cut across both content areas as well as more generic process skills. Nearly equal weight or attention is typically placed upon both content and the generic skills so students are getting opportunities to develop them across courses. Faculty expect students to master competencies at a basic or foundation level that stress acquiring basic information and understanding it. However, even beginning in the freshman year, faculty expect students to master more sophisticated competencies that require advanced reasoning or problem-solving abilities. For example, at King's College, faculty identified a series of general liberal arts learning skills (effective writing, effective oral communication, library and information technology, computer competencies, critical thinking, and quantitative reasoning) that were embedded within all academic programs and within individual courses. At Ford Motor Company, about two-thirds of their competencies were centered on the generic process skills (including teamwork) with a particular focus on innovation, risk-taking, and creativity. In addition, across these process skill competencies, there were specific statements about diversity and cultural sensitivity. The remaining one-third of their competencies directly addressed the business knowledge that their employees need to be effective in their positions.

Why was it important to define *specific* competencies? One main reason was that specific articulations of competencies informed and guided subsequent assessments at the course, program, and institutional levels. Secondly, specific competencies allowed faculty and students across campus (as well as other stakeholders such as employers or policymakers) to have a common understanding about the specific skills and knowledge that undergraduates should master as a result of their learning experiences. Assuming that faculty used a formal process to get feedback about what the competencies should be, stakeholders were more likely to accept and value them. Third, specific competencies provided directions for designing learning experiences and assignments that helped students gain practice at using and applying these competencies in different contexts.

Selecting Assessment Methods for the Competency-Based Educational Initiative

In these case studies, once faculty and staff had identified and defined the important competencies, they typically decided which particular assessment methods seemed to be the strongest in terms of measuring these competencies.

Selecting Assessment Methods: Strong Principles for Academic Leaders

Principle #5: Multiple assessments of competencies provide useful and meaningful information that is relevant to decision-making or policy-development context.

Principle #6: Faculty and staff fully participate in reviewing and making decisions about the strongest assessment instruments that will measure their specific competencies.

- Consider student perspectives in assessment decisions; and
- Provide formal training for faculty and staff to learn how to assess competencies and make informed decisions about the strongest instruments.

Faculty and staff usually benefited significantly from formal training in reviewing and selecting the strongest instruments. In addition, if they decided to create their own instruments, they needed help in designing them. Internal experts, especially social science faculty, institutional researchers, and assessment staff, provided guidance to faculty and critiqued their instruments mainly to offer suggestions for improvement. Staff members with strong expertise in technology offered recommendations about how assessments may be designed using current technological capabilities that already existed on campus. Faculty development was a serious endeavor at King's College, where professors were encouraged to participate in an ongoing series of seminars during the summer or a particular semester. The goal was to help faculty gain self-confidence and to be prepared professionally to implement their new assessment ideas. Group training in computer literacy, critical thinking, or writing across the curriculum were necessary for faculty to become responsible for the total education of their students (Farmer, 1988).

Faculty and staff participation in selecting the strongest and most appropriate instruments to assess student learning was crucial. Faculty and staff were more likely to trust and value assessment results if they were consulted during the instrument review process and before decisions were made to use them. Assessments were important since students were asked to demonstrate what they knew or could do with their knowledge. Faculty and staff tried to select assessments that would provide meaningful and useful information to inform key audiences about student learning. However, targeted audiences, such as policymakers, may value certain types of instruments more than other methods. For example, in Missouri the members of the state's Higher Education Coordinating Board initially believed that commercially developed tests were the main instruments that provided meaningful data. This resulted in the Board initially providing funds only for colleges and universities that used such instruments in their assessment programs. Recently, the Board began to provide resources to institutions that want to develop local assessment methods. However, they still provide greater sums of money to colleges that use commercially developed tests. In reality, this type of belief among key policymakers can influence the decisions that local academic leaders make, especially given limited resources.

Faculty and staff chose multiple measures to directly assess certain competencies. For example, faculty at Northwest Missouri State University used the Academic Profile to assess writing skills, college-level reading, and critical thinking of undergraduates. However, they also developed their own assessment instrument whereby students were asked to read multiple documents about a real issue or problem and then state their positions or justify the best solution to a problem in writing. Faculty designed this approach to determine if students were mastering the necessary writing competencies. The writing faculty worked together to develop and implement scoring rubrics to assess student work. Undergraduates were required to take this writing assessment at the end of their second writing course. Students were typically given a series of short, related readings (often from newspapers or magazines) about a controversial topic and then asked to respond to specific prompts.

Faculty also frequently used a combination of course-embedded assessments and locally developed assessments that were administered outside class. Most faculty believed that students were more highly motivated to take the assessments seriously when they were embedded within existing courses. However, such assessments that were designed by an individual faculty member may only assess his or her own particular expectations for student learning. When faculty collaborated together to articulate common expectations and develop some common assessments, they can glean useful information about student performance. Faculty at King's College in each major program area developed sophomore-junior projects to assess students' abilities to transfer thinking and communication skills to a selected question or project relating to their academic field of specialization. This assessment served as a screening device to identify

students who needed follow-up support services that responded to their deficiencies. Furthermore, a senior level, integrated assessment helped faculty in students' majors to make judgments concerning students' readiness to function at an effective level for meeting the expectations of faculty and employers.

Dealing with Data Ramifications: Strong Principle for Faculty and Staff

> *Principle #7: The precision, reliability, validity, credibility, and costs are all considered and examined in making selections about the best commercially developed assessments and/or locally developed approaches.*

Faculty and staff at Northwest Missouri State University used both commercially developed tests, such as the Academic Profile, and locally developed approaches. The Academic Profile has a record of reliability and validity since a commercial organization has used experts to assess these dimensions over a long period of time. However, such instruments may not always capture all of the specific competencies that faculty expect students to master. Therefore, at Northwest Missouri State University, the faculty also created their own scoring rubrics to assess students' writing competencies. They then spent considerable time training all raters. Initially, all raters reviewed the same two to three different samples of student work and then determined how close their ratings were to each other's scores. When there were major disagreements in ratings, they discussed their reasons for assessing student work in a certain way. These discussions and reviews of rationales for their individual judgments helped to strengthen the consistency of their ratings. Faculty viewed this process as inordinately time consuming, but all faculty raters were paid by the hour (as overload pay) for their work in reading student essays. The formal training that faculty developed for all reviewers and raters of student work helped to promote the reliability of these assessments. Both reliability and validity were enhanced by the use of clear, articulate scoring rubrics (Palumbo and Banta, 1999). In addition, the use of a real-world problem presented from the context of several different sources of information helped students to examine an issue and justify their own solutions.

Creating and Ensuring Learning Experiences Lead to the Mastery of Competencies

In the majority of these case studies, academic leaders, faculty, and staff intentionally planned and explicitly linked their competencies across several levels. Competencies were embedded within individual courses. They were also aligned with the overall goals of academic programs and with general education. These linkages were crucial and fostered greater coherence in the curriculum. If students were to reach the intended competencies, they needed multiple opportunities across the curriculum to learn, practice, and master these skills. In addition, these clear linkages also should lead to more meaningful data.

Linking Competencies Across the Institution: Strong Principles for Academic Leaders, Faculty, and Staff

Principle #8: The competency-based educational initiative is embedded within a larger institutional planning process.

- Directly link and align competencies with the goals of courses, academic programs or majors, and/or general education; and
- Demonstrate these linkages by providing documentation that clearly illustrates each linkage.

Principle #9: The assessments of competencies are directly linked with the goals of the learning experience. For example, assessment processes are designed to measure the intended outcomes of the course or major.

At King's College, a set of six competencies was embedded within individual courses in both general education and across all academic programs. Faculty identified the specific courses where students will master the competencies beginning in the freshman year and continuing through the senior year. The official documentation that all program faculty completed was referred to as "competency growth plans." Faculty initially identified the general competency and then provided a more specific description of each competency by outlining an average of five to seven additional statements. Next, the strategy for getting students to work on these competencies was highlighted. These strategies were typically the specific types of assignments that students completed in their courses, such as argumentative essays. Finally, faculty identified specific assessment criteria that guided the actual course-embedded assessments of student work. Faculty at Northwest Missouri State University developed similar plans linking their "key quality indicators" across both general education and all academic programs. Faculty were also required to document their work and explicit linkages by integrating these features into their strategic plans.

When faculty fully developed and articulated these important linkages, they created strong curriculum plans that address the following questions: Where in the curriculum did students learn and practice skills such as writing, critical thinking, speaking, and teamwork? What teaching strategies and assignments were given to students to help them develop these skills? What assessments were selected to determine if students were mastering the competencies? What types of skills (such as problem solving or writing) should be required across courses in general education and all majors? When faculty reflected upon, discussed, and answered these questions, they clearly demonstrated their plans through formal documentation that was completed and shared with relevant stakeholder groups.

Reviewing Assessment Results to Identify Changes to Strengthen Student Learning

Once faculty and staff gathered assessment data, then they analyzed and interpreted the results. The main goal was to report the assessment findings in a clear and meaningful way that would be

understood by diverse stakeholder groups. The greatest challenge was to use the assessment results to make important decisions to strengthen student learning.

Reviewing Assessment Results: Strong Principles for Academic Leaders, Faculty, and Staff

Principle #10: The assessment results are used in making critical decisions about strategies to improve student learning or allocation of resources.

- Evaluate assessment processes and methods periodically to identify appropriate revisions; and
- Generate assessment results that are reliable and can be replicated (e.g., the same results are achieved when assessments are repeated under the same circumstances).

Principle #11: The assessment results are clear and reported in a meaningful way so that all relevant stakeholders fully understand the results.

- Share the results on a regular basis with appropriate stakeholders; and
- Teach and advise target audiences to effectively interpret and apply assessment results to their decision-making and policy-development responsibilities.

Principle #12: The institution experiments with new ways to document students' mastery of competencies that supplement the traditional transcript.

- Document student learning in new ways that are meaningful and clearly understood by key stakeholders including students and employers.

As faculty and staff implemented their competency-based educational initiatives, they often experimented with new ways to report and share student learning. Some employers were dissatisfied with traditional transcripts. The National Science Foundation (NSF)-funded consortium at Hagerstown Community College explored the best way to create a career transcript by seeking feedback from employers about what type of information was useful and meaningful to them. This career transcript is still under development. However, it most likely will demonstrate the levels of student mastery of specific competencies (i.e., in problem solving or teamwork). One major policy issue associated with the career transcript is determining who will have control over the information that gets entered into this official document that will be shared with college administrators and employers. The NSF consortium let students decide what

assessment results they wanted to have placed on their career transcripts. If students performed poorly on a certain competency assessment, they could decide to suppress this information by not reporting it on the career transcript.

As faculty and staff reviewed their assessment results, the entire set of processes was typically evaluated over time and subject to change. If they found that certain processes were not working effectively, they had the opportunity to revise their work. In the NSF-funded consortium work, they found that managers or recruiters from different companies did not understand the assessment results that were reported on the career transcripts. Therefore, this group worked on a second iteration and continued to seek feedback from employers who typically hired their graduates. The main goal was to express the competency-based assessment results in a meaningful and clear manner so employers could fully understand the career transcript.

If competencies were clear, meaningful, and fully understood by relevant stakeholders, there was greater likelihood that linkages across systems could be built. However, equally important were the assessment results and whether there were high levels of reliability and validity. If the stakeholders were satisfied with the levels of reliability and validity, it was more likely that such assessments were used to gauge student mastery. If students reached sufficient levels of performance as evidenced by their results on competency-based assessments, they were likely to get the appropriate courses waived or to receive credit based upon their assessment results.

The strongest potential for this type of competency-based system across secondary schools, community colleges, and universities was evident in the Proficiency-based Admission Standards System developed in Oregon. This system required students to demonstrate proficiencies in six subject areas: math, English, social science, science, visual and performing arts, and second languages. These proficiencies were being phased in as admissions requirements for colleges and universities in Oregon over a 4-year period. A benefit of this type of system is that high school students know precisely what is expected of them. In Missouri, the Higher Education Coordinating Board's mandate that all institutions follow the same set of goals for general education also helped to create smooth transfers for students who wanted to enter another institution within the state.

5. CONCLUDING OBSERVATIONS

Future work should continue to examine issues of transportability of learning experiences across academic programs and institutions by focusing on how reliability and validity are addressed.

The case study institutions and entities discussed in this report illustrate strong practices that ensure the effective use of competencies. While some innovations may begin with support from external grants by funding agencies, these initiatives are difficult to maintain without committed campus leadership and a solid sense of ownership from faculty and staff. If academic leaders want changes to have a real impact on student learning, they must enlist the services of broad groups of faculty, staff, and administrators—rather than individual pockets of faculty—to work on the initiatives, gradually implementing change across the curriculum with the goal of strengthening students' skills and competencies.

As work proceeds on competency-based educational initiatives, faculty and staff will probably find that two of the most challenging tasks are identifying and implementing strong assessment methods. They must then accomplish the equally challenging task, particularly critical for systems of higher education, of ensuring that the assessment methods are reliable and valid. Even institutions with a long history of defining and assessing competencies may find it difficult to monitor, maintain, and document the reliability and validity of their assessment work because faculty and staff may not fully understand these two technical concepts. The case studies exemplified in this report can be useful in guiding internal institutional discussions about the groundwork necessary to address this critical area.

Faculty and staff who use commercially developed assessment methods produced by national testing companies frequently rely on these organizations to document that their testing methods are reliable and valid. Some dissatisfied faculty do not believe that commercial tests accurately or meaningfully measure whether students have achieved the education goals specific to the academic program or institution. In addition, they find that these instruments do not provide much direction nor guidance about where and how to improve student learning. For example, students may perform poorly on a critical thinking test, but such results do not tell faculty exactly which dimensions of critical thinking need to be improved.

Given this dissatisfaction, an increasing number of faculty are developing their own assessments, particularly in writing. They are addressing reliability issues by training assessors extensively about how to score student work consistently over time. Although there are limited data about the actual reliability and validity of these assessments, faculty and staff do benefit from formal training in these areas and from seeking advice or help from their on-campus experts. Such experts include institutional researchers and assessment staff, as well as faculty members in the social sciences with experience in statistics or educational psychology. These experts can help faculty create strong, locally developed instruments and then track their reliability and validity over time. In future work, faculty can explore ways to design local assessments that are increasingly reliable and valid.

Some states, such as Missouri, are working toward a transportable system of postsecondary education so undergraduates can move between institutions more smoothly. It is unlikely that a national system, where competencies have a common meaning in a variety of settings, will be developed and accepted among institutions. However, academic leaders, faculty, and staff within individual states are finding that they can work collaboratively to describe, package, and record student learning in terms of specific competencies. Such initiatives will clearly demonstrate the specific skills and levels of learning that ultimately should provide meaningful information to employers who hire college students.

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Rosenberg, M. J. (2000). *E-Learning: Strategies for Delivering Knowledge in the Digital Age*. New York: McGraw Hill.

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Voorhees, R. A. (2001). *Measuring What Matters: Competency-Based Learning Models in Higher Education*. New Directions for Institutional Research. San Francisco: Jossey-Bass.

Wingspread Group on Higher Education. (1993). *An American Imperative: Higher Expectations for Higher Education*. Racine, WI: The Johnson Foundation, Inc.

6. ANNOTATED BIBLIOGRAPHY

The purpose of this bibliography is to be a reference for people interested in using competencies as an alternative to more traditional measures of student achievement in postsecondary education. As such, it is not meant to be exhaustive; rather, it is illustrative of the many works available about competencies—their definition, measurement, and use. "Competencies" as used in this bibliography refer to specific statements of student performance in terms of skills, knowledge, and abilities. Several questions guided the choice of articles, books, and monographs to be included. First and foremost, were competencies explicitly used? Were there explicit statements of attempts to grapple with student competence? How were those explicit competency statements used in the processes of the activity? How were competencies documented? How were competencies particularly useful in the transition from one activity to another?

In taking this approach, certain bodies of literature were not included in order to keep the bibliography manageable—for instance, numerous volumes on performance indicators, performance funding, accountability, and assessment were omitted. The number of institutional examples was limited as well, in order to focus on the use of competencies in larger processes. The constraint of not giving too many individual institutional citations curtailed the number of practical examples given, because many institutions document narrowly and do not contain guidelines on how to adapt approaches to a variety of institutional settings.

Many possibilities of specific occupational and industry-specific competency lists that have been compiled by various groups have not been included. For those interested, a few suggested starting points are the National Skill Standards Board Web Site (www.nssb.org), which includes links to state skill standards sites; the Occupational Skill Standards Projects at www.ed.gov/offices/OVAE/OccSkills/index.html; the Secretary's Commission on Achieving Necessary Skills site at Johns Hopkins University (www.scans.jhu.edu/default.htm); O*NET, the Occupational Information Network, at www.doleta.gov/programs/onet/; and the National Center on Education and the Economy (www.ncee.org).

This bibliography is composed of five sections. The first is a general introduction to the history and basics of competencies in postsecondary education. The second contains citations about entry into postsecondary education, including competency-based admissions and placement. The third section focuses on the use of competencies within postsecondary education, such as competency-base curricula, general education competencies, and transfer competencies both within and across providers. Exit from postsecondary education, including end-of-program competencies, those used for employment placement, and those used for admittance to graduate or professional schools, are found in the fourth section. Finally, the fifth section is about the use of competencies for overall institutional effectiveness, including program improvement, accountability, performance budgeting, and accreditation.

Part I. General Introduction to Competencies in Postsecondary Education

This section is included for the novice who is in need of a general introduction to the use of competencies in postsecondary education. Included here are basic materials about the construction of competencies as well as the historical development of the use of competencies.

Basics of Competencies

Mager, R. F. (1997). *Preparing Instructional Objectives: A Critical Tool in the Development of Effective Instruction* (3rd ed.). Atlanta, GA: The Center for Effective Performance, Inc.

Mager is considered one of the leading experts on instructional objectives. This book is a straightforward, how-to book on constructing usable instructional objectives (competencies). The strength of his approach comes from its applicability to both education and corporate training situations. His book is written with a broad, accessible perspective.

Parry, S. B. (1998). Just What is a Competency? (And Why Should You Care?) *Training*, (June): 58-64.

This article gives a business- and training-oriented perspective about the important differences between competencies and traits or characteristics, skills, or abilities, as well as between competencies, styles, and values. For Parry, competencies are generic, limited to 10 to 14 per company, and how individuals act them out is dependent largely on personality ("style/values"). Assessment techniques advocated include 360-degree feedback, role playing in a controlled laboratory situation, and use of interactive media.

Walvoord, B. E., and Anderson, V. J. (1998). *Effective Grading: A Tool for Learning and Assessment*. San Francisco: Jossey-Bass Publishers.

Walvoord and Anderson's book is about making explicit the criteria used in grading. Of particular interest are Chapter 5, "Establishing Criteria and Standards for Grading," and Appendix C, "Examples of Primary Trait-Based Scales Developed by Faculty." These are useful because of the explicitness necessary when writing competency statements and when agreeing on the criteria used to evaluate competence. Although these pages focus on a specific technique, Primary Trait Analysis, the principles and processes are useful when working with competencies.

Historical Background of Competencies

Doll, W. E., Jr. (1984). Developing Competence. In *Competence: Inquiries into its Meaning and Acquisition in Educational Settings*, edited by E. C. Short, 123-138. Lanham, MD: University Press of America.

Grant, G., and Associates. (1979). *On Competence: A Critical Analysis of Competence-Based Reforms in Higher Education*. San Francisco: Jossey-Bass Publishers.

This volume is one of the few available that has as its subjects both competency and higher education; most of the other general books on competency-based education noted

in this bibliography are about elementary and secondary education. A definition that is of value is offered early in the book: "Competence-based education tends to be a form of education that derives a curriculum from an analysis of a prospective or actual role in modern society and that attempts to certify student progress on the basis of demonstrated performance in some or all aspects of that role. Theoretically, such demonstrations of competence are independent of time served in formal educational settings" (p. 6). Of particular note are the chapters by David Riesman, "Society's Demands for Competence," and Thomas Ewen, "Analyzing the Impact of Competence-Based Approaches on Liberal Education." Riesman gives a historical summary of societal forces and why they resulted in competency-based education. Ewen grapples with the ever-present tension between the concepts of liberal education and competence.

Klemp, G. O., Jr. (1979). Identifying, Measuring, and Integrating Competence. In *Defining and Measuring Competence,* edited by P. S. Pottinger and J. Goldsmith. New Directions for Experiential Learning, No. 3, 41-52. San Francisco: Jossey-Bass Publishers.

This chapter from a late 1970s monograph contains a useful discussion about the definition of competence, the interaction of competence and performance, and integration of competencies. Klemp also discusses responses to testing for competence illustrating the problems with traditional testing and suggests "intermediate criteria" for grading—efficiency, parsimony, thoroughness, and outcome effectiveness. He acknowledges that there is no one right answer: "A wide range of permissible responses helps prevent 'ceiling' and 'floor' effects that restrict the useful range of competency measurement" (p. 48).

Urch, G. E. (1975). A Philosophical Perspective on Competency Based Education. In *The Foundations of Competency Based Education,* edited by R. T. Utz and L. D. Leonard, 30-47. Dubuque, IA: Kendall/Hunt Publishing Co.

This chapter and the Doll entry above are for those who are interested in the philosophical background of competency-based education. They are from the 1970s but remain salient. Doll distinguishes "competence" and its relationship to "performance" based on Chomsky, Piaget, and Bruner. Urch cites critics, including Neill, Goodman, Rogers, and Illich, and then traces the "roots" of competency-based education back to Rationalism (Descartes and Spinoza), Empiricism (Bacon, Locke, Herbart, and Thorndike), Pragmatism (Dewey), and Behaviorism (Skinner and Gagne).

Part II. Competencies for Entry into Postsecondary Education

Citations in this section of the bibliography are about the use of competencies in the undergraduate admissions process. The other topic pertinent to this section is placement examination. However, very little has been written about the use of competencies in collegiate placement examination. Although some assessments and testing products are based on competencies (such as the Regents Examinations, New Standards, and ACT Work Keys), there is little documentation of their use in postsecondary education either (1) specifically as placement examinations, or (2) because of their focus on competencies.

Admissions

Conley, D. T. (1996). Daddy, I'm Scared: A Prophetic Parable. *Phi Delta Kappan,* 78(4), 290-297; and Where's Waldo? The Conspicuous Absence of Higher Education from School Reform and One State's Response. *Phi Delta Kappan,* 78(4), 309-314.

These two articles by Conley are about the Proficiency-based Admission Standards System (PASS) Project in Oregon. PASS is a high school graduation/college admission system based on proficiencies (competencies). The "prophetic parable" article is about the context PASS operates in, how they determined the proficiency standards, and how he believes those standards will force higher education to change, particularly with regard to admission requirements. "Where's Waldo?" focuses on how the PASS project fits into statewide education reform across the K-16 continuum. A balanced appraisal is given of opportunities and obstacles.
(See also the PASS Web Site: http://www.ous.edu/pass/documents/archive).

Conley, D. (1999). *Statewide Strategies for Implementing Competency-Based Admissions Standards.* [On-line]. Available: www.sheeo.org/publicat/pub-k16.htm

Conley summarizes the results of a survey and case studies done by the State Higher Education Executive Officers organization regarding competency-based admissions. These systems are defined as "requir[ing] students to demonstrate their knowledge and skills in specified academic areas and at specified performance levels." Eleven states replied affirmatively that they were considering or implementing competency-based admissions systems. Six states (CO, GA, MD, OH, and WA, WI) were chosen for additional study. The document includes a discussion of the policy context and reasons for considering a competency model; a short overview of the development, implementation, and assessment of competencies; what the results have been so far in these states, and what the continuing problems are in the conversion to such systems. Conley notes that whether these competency-based systems work "better" than traditional admissions systems is being closely watched.

Roberts, R., and Robson, R. (1998). *Electronic Transcripts in the Age of Standards.* [On-line]. Available: www.ous.edu/pass/documents/archive (click on documents, then down to archive).

This is a short overview of how electronic transcripts are specified and will be constructed for use with the Oregon PASS (Proficiency-based Admission Standards System). They contain three levels of data. The first is "summative scores or binary decisions" regarding a student's achievement. The second level will be "verifications" of these decisions and will consist of who made the decision, based on what, and when the decision was made. Finally, the third level is the actual work on which the student's achievement level is based.

Sills-Briegel, T., Fisk, C., and Dunlop, V. (1996). Graduation by Exhibition. *Education Leadership,* 54(4), 66-71.

This article is an example of how competencies are documented and assessed as a high school graduation requirement. This requirement—an individual thesis project—uses a committee of three overseers to work with each student. The committee comprises one instructor randomly assigned to the student and two people of the student's choice (one

often comes from outside the high school, either a member of the community or from a local university). Levels of achievement are "not proficient," "proficient," and "distinguished performance." Criteria used to evaluate the projects include personal responsibility, critical thinking, writing, public speaking, and multimedia presentation. No indication is given as to how graduates use these projects either as supporting evidence for college admission or for job attainment.

University of Wisconsin System. (1998 Spring). *Final Report: The University of Wisconsin System Competency-Based Admission Pilot Project.* [On-line]. Available: www.uwsa.edu/acadaff/cba/report.htm

In 1992, University of Wisconsin began studying competency-based admissions as an alternative to traditional admissions for those students attending high schools with nontraditional curricula. It is now an option available to students, although it is not meant to replace the existing admissions system. The final report is useful because it contains data comparing traditional admissions measures (ACT and grades) with the new competency-based admissions measures, as well as data on retention of students admitted using the competency-based approach. Measures of time put into the admissions decisions by university personnel and a sample admission reporting profile are also given.

Part III. Competencies Within Postsecondary Education

The purpose of this section is to highlight the use of competencies within postsecondary education. Competencies may be used in a variety of ways, including as curricular guides, as a means of validating experiential education and knowledge learned outside a formal educational setting, for specifying and easing articulation and transfer, and as feedback for students regarding their progress and learning expectations.

Experiential Education

Lamdin, L. (1992). *Earn College Credit for What You Know.* 2nd ed. Chicago: Council for Adult and Experiential Learning.

Whitaker, U. (1989). *Assessing Learning: Standards, Principles, & Procedures.* Philadelphia: Council for Adult and Experiential Learning.

Although both books are written from the perspective of awarding credits (due primarily to the prevalent academic climate when they were first published), the standards proposed and the information given are applicable to competency-based processes and projects. Whitaker outlines and explains the standards for Prior Learning Assessment as designed by the Council for Adult and Experiential Learning. Lamdin affirms the many nonacademic, nonclassroom methods of learning.

General Education

Alverno College Faculty. (1994). *Student Assessment-as-Learning at Alverno College.* 3rd ed. Milwaukee: Alverno College.

Farmer, D. W. (1988). *Enhancing Student Learning: Emphasizing Essential Competencies in Academic Programs*. Wilkes-Barre, PA: King's College.

Both Alverno College in Wisconsin (www.alverno.edu) and King's College in Pennsylvania (www.kings.edu) were early postsecondary innovators incorporating core competencies into their curricula over 20 years ago. Alverno's faculty restructured their institution around eight abilities each student should have: communication ability, analysis, problem solving, decision making, social interaction, global perspectives, effective citizenship, and aesthetic responsiveness. They couple their focus on abilities with student assessment that is authentic and reality-based. King's College came to large-scale curriculum reform as a result of working on a planning project. In their CORE curriculum taken by all students, they seek to instill the skills of liberal arts learning: critical thinking, effective writing, effective oral communication, library and information literacy, computer competence, creative thinking and problem solving, quantitative reasoning, and moral reasoning. Farmer presents a thorough description of the hurdles, as well as the benefits, of the new approach.

Jones, E. A. (Ed.). (1996). *Preparing Competent College Graduates: Setting New and Higher Expectations for Student Learning*. New Directions for Higher Education, No. 96. San Francisco: Jossey-Bass Publishers.

Jones gives a summary of the recent press for "competent" college graduates in the first chapter of this monograph. Subsequent chapters are devoted to comprehensive reviews regarding what competencies are generally agreed upon in speech communication and listening, effective writing, critical reading, and problem solving.

Career and Professional Education

Gonczi, A. (1994). Competency-Based Assessment in the Professions in Australia. *Assessment in Education*, 1(1), 27-44.

This article is a good introduction to the entire competency-assessment process. The section included on policy issues is comprehensive, focusing primarily on asking questions, not necessarily answering them. Two case studies included in the article give real-world examples of competencies, how they were assessed, and what the criteria were for evaluation of assessment results. These are good, practical, and short examples of implementation.

Paulson, K., and Ewell, P. (In press). *21st-Century Skills for Community College Education: The Critical Role of Competencies*. Mission Viejo, CA: League for Innovation in the Community College.

Paulson and Ewell advocate using competencies to restructure community college education across the three traditional curricula of developmental education, general education, and vocational education. They discuss the pressures for competencies, benefits of using competencies for both students and institutions, how to determine competencies, and opportunities for community colleges to use competencies. The League's Web Site is www.league.org

Competency-Based Curricula

Sinclair Community College. (1998). *Continuous Improvement Through the Assessment of Student Learning Outcomes: A Work in Progress--Department Assessment Reviews and Program Learning Outcomes*. Dayton, OH: Sinclair Community College.

This document provides a good example of an institution whose faculty have grappled with how to determine student learning outcomes. For each department, the document lists the guidelines and existing outcome lists referenced, student learning outcomes, a cross-listing of those outcomes with existing courses, assessment methods, the results of assessments, what institutional and departmental action has been taken based on those results, and perspectives on general education and overall outcomes.

Western Governors University. *A Proposed "Academic Infrastructure" for Credentialing at the Western Governors University (WGU)* [On-line]. Available: www.wgu.edu/wgu/about/acad_infra.html

This working document was used in the early stages of developing Western Governors University (WGU). It gives the original conceptualization of the competency-based credentials offered by the institution, as well as discusses the implications for practice in terms of the structure of the institution, staffing requirements, and how students would progress through WGU programs to successful degree completion.

Student Information on Expectations and Educational Progress

Banta, T. W., and Associates. (1993). *Making a Difference: Outcomes of a Decade of Assessment in Higher Education*. San Francisco: Jossey-Bass Publishers.

Banta, T. W., Lund, J. P., Black, K. E., and Oblander, F. W. (1996). *Assessment in Practice: Putting Principles to Work on College Campuses*. San Francisco: Jossey-Bass Publishers.

These two books by Banta and colleagues are compilations of institutional assessment programs; some of these programs are based on student demonstration of competence. In *Assessment in Practice,* each major heading (such as "Assessing Student Achievement in the Major") begins with a "chapter guide" that lists the assessment programs contained in the chapter "by institution, by subject area, by assessment method, and by case strengths." These volumes are good for identifying institutions that are either currently using competencies or might have tried and decided against the use of competencies in their educational programs. Additionally, "assessment centers" are often used in the documentation of student competence; *Making a Difference*, Chapter 15, includes the pros and cons of such an approach.

Meade, J. (1998). A Solution for Competency-Based Employee Development. *HR Magazine*, (December): 54-58.

This product review for a human resources magazine highlights a software package that (1) tracks employees' competencies, (2) monitors how those competencies match job requirements, (3) links to available online training materials, and (4) shows whether

employees are making progress in their training for the competencies. Postsecondary institutions might start documentation of student competency with something similar.

Part IV. Competencies for Exit from Postsecondary Education

Workforce skills are the primary focus of competencies used for exit from postsecondary education. This section includes citations on basic and workforce skills, performance certification, how to match individual skills with particular job requirements, and the skills necessary for admission to and success in professional fields.

Basic Skills

Comprehensive Adult Student Assessment System (CASAS). (1997). *Extending the Ladder: From CASAS to Work Keys Assessments: Executive Summary* [On-line]. Available: www.nifl.gov/CASAS-ACT.html

This executive summary offers the results of a study done linking two systems—CASAS' Workforce Learning Systems, a basic adult literacy assessment system, and Work Keys, an assessment of employability skills. The article has a profile of the two systems that includes examples of assessment criteria used in both and practical descriptions of how the two systems are meshed together (the "extension ladder effect"). This overlap of systems allows them to collectively address a broader range of competence. This increased range provides a service to individuals who enter the basic literacy system and need to articulate to a more advanced skill level. Both systems use "real-life" workforce tasks, as opposed to "academic tasks." The study used data from 494 individuals who were randomly selected from 27 sites in eight states. The authors conclude that Workforce Learning Systems is suitable for basic skill levels, the mid-level of skills are addressed by either system, and that higher skill levels are best assessed using Work Keys. (See also ACT's *Work Keys Targets for Instruction.* (1994). American College Testing Program: Iowa City, IA. Books are available in the following subject areas: Writing, Applied Mathematics, Teamwork, Observation, Locating Information, Listening, Applied Technology, and Reading for Information.)

Certification of Performance

Browning, A. H., Bugbee A. C., Jr., and Mullins, M. A. (Eds.). (1996). *Certification: A NOCA Handbook.* Washington, DC: National Organization for Competency Assurance.

This volume is an excellent introduction to certification. Of particular interest to those interested in competency-based initiatives are the chapters "Job Analysis" (Chapter 2), "Standard Setting" (Chapter 5), and "Future Trends in Credentialing" (Chapter 9). Chapter 2 provides a clear and unambiguous description of how to decompose a job into various tasks. The chapter on standard setting outlines the various theories of establishing standards for performance and methods for arriving at those standards.

Pottinger, P. S. (1979). Competence Assessment: Comments on Current Practices. In *Defining and Measuring Competence,* edited by P. S. Pottinger and J. Goldsmith. New Directions for Experiential Learning, No. 3, 25-39. San Francisco: Jossey-Bass Publishers.

This chapter from the late 1970s focuses on licensing and registration based on demonstration of professional competence. It gives a short background introduction to professional competence and foreshadows many of the problems that continue to arise today, such as the reductionism inherent in long lists of behaviors and the need for multiple exemplars of competence.

Matching Skills and Job Requirements

Resnick, L. B., and Wirt, J. G. (Eds.). (1996). *Linking School and Work: Roles for Standards and Assessment.* San Francisco: Jossey-Bass Publishers.

Resnick and Wirt's volume is based primarily on SCANS and New Standards work. For the purposes of this bibliography, the most important section is Part One: Standards-Based Education for Workplace Readiness. The four chapters contained here are all useful, especially John H. Bishop's chapter "Signaling the Competencies of High School Students to Employers," because it is a practical approach to linking competencies with seeking employment.

Professional Education

Curry, L., Wergin, J. F., and Associates. (1993). *Educating Professionals: Responding to New Expectations for Competence and Accountability.* San Francisco: Jossey-Bass Publishers.

Hagedorn, L. S., and Nora, A. (1996). Rethinking Admissions Criteria in Graduate and Professional Programs. In *Assessing Graduate and Professional Education: Current Realities, Future Prospects*, edited by J. G. Haworth. New Directions in Institutional Research, No. 92, 31-44. San Francisco: Jossey-Bass Publishers.

This chapter is a quick summary of graduate admissions procedures, including a discussion of alternatives. Hagedorn and Nora highlight Stark et al.'s study of professional competence and ask the question, "How can [these competencies] be predicted?" Their conclusion is that more complex measures such as writing samples, plans for research, and structured interviews are necessary for determining graduate admission, but they do not go so far as to articulate admissions competencies. In a search to find institutions using alternative forms of admissions criteria, only a handful of institutions could be identified. Within those institutions, the departments using alternative criteria were primarily in the social sciences. These techniques included differential weighting of factors, portfolios, two-tier admissions processes (two onsite visits), and group interviews.

Stark, J. S., Lowther, M. A., and Hagerty, B. M. K. (1986). *Responsive Professional Education: Balancing Outcomes and Opportunities,* ASHE-ERIC Higher Education Report, No. 3. Washington, DC: Association for the Study of Higher Education.

Stark, Lowther, and Hagerty's monograph from the 1980s documents the results of an extensive literature review. From their review, the authors identified six professional competencies—conceptual, technical, contextual, interpersonal, integrative, and adaptive—and five professional attitudes—career marketability, professional identity, ethical standards, scholarly concern for improvement, and motivation for continued learning. Curry, Wergin, and their associates build on the work of Stark and her colleagues in their 1993 volume elaborating on the concept of professional competency. The first section sets the stage for the renewed urgency for competencies. The second section highlights how competencies allow distinctions to be made in professional education for (1) linking to actual practice, (2) liberal learning, (3) ethics, and (4) critical thinking and problem solving. The third and final section discusses areas of praxis for the intelligent use of professional competencies in the 21st century.

Workforce Development/Vocational Education

Evers, F. T., Rush, J. C., and Berdrow, I. (1998). *The Bases of Competence: Skills for Lifelong Learning and Employability.* San Francisco: Jossey-Bass Publishers.

This book pulls together a number of issues not previously covered in a single volume. The first part, "Understanding Competence," includes chapters on "the humbling effect" that occurs when recent college grads/new employees realize that they are unable to apply what they learned at college. The second chapter offers a common language for use with competencies. Part Two outlines the four "Essential Skills and Competencies" the authors have identified—managing self, communicating, managing people and tasks, and mobilizing innovation and change. Part Three is the useful essence of this book: "Developing Competence." Three chapters explain (1) how the transition from college to workplace needs attention from both academics and businesspeople, (2) how colleges should be vigilant in their competency-based curricula and courses, and finally (3) how employers can be alert to the effects of their organizational interactions with recent graduates as well as their partnerships with postsecondary education institutions. Part Four consists of three case studies illustrating the principles outlined in the earlier sections.

Packer, A. (1998). *The End of Routine Work and the Need for a Career Transcript.* Presented at the Hudson Institute's Workforce 2020 Conference, October 7. [On-line]. Available: www.hudson.org/wf2020/wp98/pdf/SESSION3.pdf

Packer discusses shifts in the match between skills that employees bring and the skills necessary for meaningful, high-paid work in the future economy. He then links this to the educational challenges created by these skill shifts. Finally, he suggests the structure of a "career transcript," which is to "provide employers with *readable, comprehensible, believable, timely and convenient documents* [emphasis in original] that will help them choose the right applicant for the job." The career transcript would include standardized tests, workplace performance assessments, and "structured assessment of classroom performance on *benchmarked classroom tasks* [emphasis in original]," although

presumably, based on his earlier arguments, "classroom" is not a necessary component of this latter requirement.

Stecher, B. M., Rahn, M. L., Ruby, A., Alt, M. N., and Robyn, A. (1997). *Using Alternative Assessments in Vocational Education*. Santa Monica, CA: RAND.

Stecher et al. write about vocational education that uses assessments to (1) improve learning and instruction, (2) certify individual mastery, and (3) evaluate program success. They recognize changes have occurred in vocational education resulting in a broader continuum of skills ranging from general workplace skills to very specific occupational skills. They point out that to evaluate skill acquisition, students must be assessed in a work context because skills are not enacted in isolation. This book contains a good introduction to the use of assessment for certification and in the validation of vocational education. (Note especially Appendix E, which is a synopsis of the Oklahoma Department of Vocational Technical Education Competency-Based Testing Program.)

U.S. Department of Labor, Office of Policy and Research. (1998, July). *Workforce Development Performance Measures Initiative: Final report* [On-line]. Available: www.wdsc.org/transition/measure/finalreport.htm

This report offers the findings of a project. One goal of the project was to determine what measures could be used by a diverse set of constituents in employment, training, and education programs to track workforce development success. The second goal was to determine standard definitions for those measures. The main areas in which these measures would be used are (1) basic adult education, (2) occupational skills, and (3) employment/re-employment skills. The final list of performance measures includes nine core measures (such as basic skill attainment and transition success rate), nine "other measures of success" (such as starting wage at entered employment and diversity of occupations), and six developmental measures (including return on investment and system penetration rate). Appendix C includes the detailed descriptions of the 24 performance measures.

Part V. Competencies Used for Overall Institutional Effectiveness

This section has as its focus the use of competencies by institutions for measuring how well an institution is meeting its goals. Included here are entries having to do with accountability, accreditation, and performance funding.

Accountability Processes

(Note: "Accountability Processes" is defined here as statewide student testing programs and measures of quality.)

National Center for Higher Education Management Systems. (1996). *The National Assessment of College Student Learning: An Inventory of State-Level Assessment Activities. A Report of the Proceedings of the Third Study Design Workshop*. Boulder, CO: National Center for Higher Education Management Systems.

National Center for Postsecondary Improvement. (1997, May). *Benchmarking Assessment: Assessment of Teaching and Learning in Higher Education for Improvement* and *Public Accountability: State Governing, Coordinating Board & Regional Accreditation Association Policies and Practices*. Palo Alto, CA: Stanford University, College of Education.

These two documents summarize statewide testing programs by state. NCHEMS' compendium includes the proceedings from a workshop supplemented with documentation on "the extent and character of current state-level activities in assessing postsecondary student outcomes." These characterizations include descriptions of the origins and development of the state's program, assessment instruments used, obstacles to expansion of assessment activities, and what the state saw as the most "important needs to mov[ing] a national assessment agenda forward." NCPI also summarizes state assessment activities to include contact information, analysis of state assessment policy including the policy context, policy type and what stage the policy was in at the time of publication, guidelines, indicators, instruments used, and assorted additional information. NCPI also includes the work of regional accrediting associations in their review. Singly each is a wealth of information; together the two documents form a powerful reference on statewide assessment and testing programs.

Nordvall, R. C., and Braxton, J. M. (1996). An Alternative Definition of Quality of Undergraduate College Education. *Journal of Higher Education*, 67(5), 483-497.

Nordvall and Braxton offer a response to traditional quality mechanisms built on reputational, resource, and value-added measures. They seek to drive the quality process back into the classroom and to the level of student engagement using Bloom's taxonomy. Their approach rests heavily with faculty and eliminates student motivation issues that are a problem with assessments "added-on" to the curriculum. Although they never use "competency" by name in their ideas, they allude to it when they describe what they mean as "the level of understanding of course content to be demonstrated by students while engaging in course-level processes" (p. 486). A short discussion on the problems of aggregating course and classroom-level information to the department and institution level is included.

Accreditation

(Note: The Council for Higher Education Accreditation (CHEA) and the Western Association of Schools and Colleges (WASC) are working on standards that incorporate student competencies, but these efforts are not public yet.)

Ewell, P. T. (1998). Examining a Brave New World: How Accreditation Might be Different. Speech presented at the 2nd CHEA "Usefulness" Conference. [On-line]. Available: www.chea.org/Events/Usefulness/98May/98_05Ewell.html

Ewell focuses on the state of accreditation and how it might continue to evolve. Three main themes frame his talk: (1) the revolution in teaching and learning, (2) the "de-institutionalization" of learning, and (3) the need for public engagement. He calls for "examining the integrity of the degree" using learning outcomes as the mechanism for this investigation. He notes that it is not merely whether the degree is of quality but how

resources and processes are "configured and used" to create a quality degree that must be considered. Practical suggestions for how to implement these ideas are given.

Teacher Education Accreditation Council. (n.d.). *Accreditation Goal and Principles of the Teacher Education Accreditation Council (TEAC).* [On-line]. Available: http://www.teac.org/accreditation/goals/index.asp

TEAC's three Quality Principles are (1) evidence of student learning, (2) valid assessment of student learning, and (3) institutional learning. The cycle created by these three principles, if done well, incorporates the need to explicitly state what student learning is expected, how that learning will be assessed, whether the assessment is valid in the eyes of the program faculty (and presumably to the groups that employ their graduates), and how that information is used to improve the program in terms of "institutional learning."

Performance Funding

Banta, T. W., Rudolph, L. B., Van Dyke, J., and Fisher, H. S. (1996). Performance Funding Comes of Age in Tennessee, *Journal of Higher Education,* 67(1), 23-45.

This short historical profile of Tennessee's performance funding process is linked to survey data collected from all 23 performance-funding coordinators in Tennessee. The survey focused on the usefulness of the various performance funding measures. "Competencies" are not specified by the state, but they are implied by the use of general education assessment and major field testing requirements in the performance funding criteria. Survey respondents noted that while these testing efforts have some effect on changing programs, it was also apparent that there is little motivation for students or institutions to take them seriously because no direct path exists linking competencies and assessments to student feedback and program improvement. (See also Banta, T. W. (Ed.). (1986). *Performance Funding in Higher Education: A Critical Analysis of Tennessee's Experience.* Boulder, CO: National Center for Higher Education Management Systems.)

Burke, J. C., and Serban, A. M. (Eds.). (1998). *Performance Funding for Public Higher Education: Fad or Trend?* New Directions for Institutional Research, No. 97. San Francisco: Jossey-Bass Publishers.

This volume is the most comprehensive and recent monograph on performance funding. With regard to competency-based initiatives, however, it is rather sparse. A close reading of individual performance indicators reveals some measures that might nominally be linked to student competency. Some examples of potential indicators include "indicators of the effectiveness of remediation," "pass rates on professional exams," "job placement of graduates," and "employer surveys." They conclude that aggregating individual student competency and achievement to arrive at program or institutional measures of effectiveness has not yet been done effectively or equitably in performance funding.

7. CASE STUDY ABSTRACTS

KING'S COLLEGE CASE STUDY ABSTRACT

In the fall 1999 semester, 18 faculty from different disciplines were interviewed at King's College. The purpose of this case study was to explore the creation of competencies and how they are assessed at King's College.

King's College is an independent baccalaureate institution that offers undergraduate educational programs in the humanities, the natural and social sciences, and specialized programs in business and other professions. King's College is rooted in the tradition of Judeo-Christian humanism and seeks to educate the entire person.

The general education curriculum at King's College during the 1970s was primarily a set of distribution requirements giving students numerous choices. The curriculum was perceived by many faculty to be a smorgasbord of learning with fragmented experiences that lacked strong connections among individual courses. As faculty grew increasingly dissatisfied with the distribution form of general education, they decided to design a new general education core curriculum with a particular focus on student outcomes. Faculty project teams designed and implemented a core curriculum to provide students with a common learning experience in the liberal arts and sciences. General education courses were created to address eight different skills of liberal learning. Each liberal learning skill, such as effective writing, began with a stated goal and then specified objectives associated with the achievement of the broader goal.

Faculty developed competency growth plans that included a definition of each liberal learning goal or competency, an indication of courses and assignments that were designed to help students develop each competency (across the entire baccalaureate degree program), and specific criteria that were used to gauge the quality of student performance. Faculty in all academic programs articulated these dimensions and reinforced key ideas in course syllabi and instructions for assignments.

Assessment at King's College was primarily course-embedded and provided students with clearly defined expectations, personalized feedback on growth, and timely indications of areas needing attention. Faculty obtained the information needed to identify and respond to the strengths and weaknesses of individual students, of teaching/learning strategies, and of curricula. The assessment program helped faculty create an integrated plan for cumulative learning. The faculty rejected standardized, longitudinal testing of student learning using commercially available instruments when they found that students did not take these types of external assessments seriously, and the tests did not measure all the areas they considered to be important. Course-embedded assessments motivated students to take these evaluations seriously and to perform at their highest levels because the outcomes counted toward their grades. Faculty designed their own assessments, including the sophomore-junior diagnostic project and the senior integrated assessment.

NORTHWEST MISSOURI STATE UNIVERSITY CASE STUDY
ABSTRACT

In the spring 2000 semester, seven faculty were interviewed at Northwest Missouri State University (Northwest). Participants were predominately full-time faculty who were directly engaged in or provided leadership for assessment. The purpose of this case study was to explore the competency-based educational system at Northwest with a particular focus on the development of competencies and how they are assessed.

Northwest is a moderately selective, learner-centered regional institution offering a range of undergraduate and graduate degree programs. In 1992, Northwest faculty and administrators adopted the Malcolm Baldridge National Quality Award criteria as a conceptual framework to discuss quality and as a template for planning and agenda setting. This action was introduced as a master plan to revitalize undergraduate education. The culture of quality plan was developed by identifying the 42 best practices and resulted in specific strategies to improve processes. Success at Northwest is measured by the value that is added to students, faculty, staff, and the region.

The Coordinating Board for Higher Education (CBHE) in Missouri oversees higher education for the entire state. A major goal of CBHE is to provide an educational system that will respond to students' needs and facilitate easy mobility across institutions. In 2000, CBHE revised statewide general education policies that directly influence general education at Northwest. These policies include an articulation of competencies that serve as specific examples of state-level expectations for student performance in general education. The competencies include specific sets of skills in communicating, higher order thinking, managing information, and valuing. The knowledge competencies focus on social and behavioral sciences, humanities and fine arts, mathematics, and natural sciences. Faculty at Northwest designed their general education program to fit their mission and will be reexamining how it meets the state-level curricular goals.

Northwest faculty follow a seven-step planning process that applies to general education as well as to all major programs. Through this process, they define major objectives or key quality indicators that are based on customers' needs and use multiple measures to determine whether these outcomes are being achieved. For example, faculty use the Academic Profile to assess general education outcomes. All undergraduates take a locally developed assessment at the end of their second writing course. Students are given a series of short, related readings about a controversial topic and then asked to respond to specific prompts. The Missouri Colloquium on Writing Assessment is a statewide organization that exists to support faculty members in all colleges and universities within the state. This group surveys institutions each year to identify the types of assessment methods used.

In the future, Northwest will be developing an electronic portfolio that can both include assessments of students' out-of-class experiences and allow for all assessment results to be posted electronically.

SINCLAIR COMMUNITY COLLEGE CASE STUDY
ABSTRACT

In the fall 1999 semester, four faculty members were interviewed at Sinclair Community College. The purpose of this case study was to explore the development of competencies and how they are assessed. Sinclair Community College is a comprehensive 2-year institution offering a diverse range of parallel university, technical, and career courses to students. It is the largest single-campus community college in Ohio and among the 20 largest in the United States. In the mid-1980s, Sinclair Community College administrators and faculty began considering the possibility of guaranteeing the entry-level skills of their graduates. They realized that before they could make such a guarantee, they should first clearly articulate student learning outcomes and determine if they were meeting employers' needs. This was the first step toward defining competencies and developing an assessment plan at Sinclair. In 1992, Sinclair decided to guarantee the entry-level skills for their graduates.

Sinclair, embracing the principles of the learning college, wanted to move toward more active and collaborative experiences for their students. Faculty believed substantial changes that would lead to better retention of material across courses and to help students reach higher levels of learning were needed.

The faculty have identified specific competencies for general education and designated courses to fulfill the seven different competencies. In effect, these competencies serve to define the specific knowledge and technical skills that college students should be able to demonstrate.

As a result of the open-door admissions policy at Sinclair, the abilities of entering groups of students vary substantially. Therefore, the college measures the entry-level competencies of students through Computer Adaptive Placement Testing (COMPASS) developed by the American College Testing Company. Faculty also developed checklists for writing and communication that served as criteria for evaluating student assignments within individual courses. For example, the writing checklist included an evaluation of assignment profile, content, organization, style, and mechanics. Each academic department at Sinclair has developed or refined multiple methods to assess student achievement of specific learning outcomes within their majors. These assessment plans are open to revisions over time. There are a variety of assessment methods that academic program faculty use, including commercially available and standardized national exams, comprehensive exams and final projects evaluated by peers, faculty and/or external evaluators, comprehensive research papers or theses, programmatic growth contracts, observations, and simulated work experiences.

A recent initiative underway at Sinclair is labeled "process learning." Some faculty are defining specific competencies for individual courses in applied critical thinking, problem-based learning, cooperative teams, and communications.

HAGERSTOWN COMMUNITY COLLEGE CASE STUDY
ABSTRACT

In the fall 1999 semester, six faculty were interviewed at Hagerstown Community College (HCC). Participants were mostly full-time faculty who were directly involved and provided leadership in the development and implementation of the competency-based educational experiences. The purpose of this case study was to explore the career transcript system used at HCC that builds upon earlier work completed on CD-ROM modules.

HCC is part of a consortium consisting of several community colleges, related industries, and a multimedia production company. This consortium was originally created in 1995 under the leadership of the Johns Hopkins University to better prepare community college graduates for the 21st century and to help students learn important competencies so that they would remain valuable employees. The consortium also wanted to provide students with a degree that would be recognized by employers in different states.

They initially worked on developing CD-ROMs to integrate workplace competencies into general education coursework. Ultimately with funding from NSF, the consortium focused on covering the Secretary's Commission on Achieving Necessary Skills (SCANS) through five CD-ROM modules assigned to a particular academic home. Each module was embedded into the appropriate existing course. One module was created for math, three modules for science, and one module for a communication course. The CD-ROMs and accompanying materials for each module constituted about 9 hours of a particular course or 20 percent of a three-credit semester course. For each particular module, faculty identified one or two primary SCANS skills that were addressed.

Faculty worked with AES, International (a commercial company) to develop behavioral indicators to demonstrate performance mastery of the SCANS skills. Instructors prepared lists of tasks and the actual behaviors they expect of students completing the projects as outlined in the CD-ROM learning experiences. Then AES translated these behaviors into an assessment scoring rubric. Faculty were taught how to use the constructed rubrics as a means of documenting student performance.

As this new system incorporating project-based modules was embedded into the curriculum, faculty and employers strongly believed that the traditional academic transcript was not sufficient to demonstrate students' mastery of key concepts and SCANS competencies. Therefore, a career transcript was designed by a group of faculty and a commercial company to indicate students' specific levels of achievement with support from NSF. In 1999, project leaders began testing this Internet-based career transcript. The main assessment results from the modules were placed into the Internet database. Students could review and print out their transcripts and decide what information they wanted to share with employers. This career transcript indicated the specific competencies that students had mastered and supplemented the traditional transcript. Organized like a resume, it listed the SCANS skills taught and levels of achievement.

COMMUNITY COLLEGES OF COLORADO
INCUMBENT WORKER PROJECT
CASE STUDY ABSTRACT

The purpose of this case study was to explore the beginning development of the Incumbent Worker project funded by the U.S. Department of Labor as 1 of 12 national demonstration grants. A consortium of community colleges and businesses are formally collaborating to address the employment needs within the state of Colorado. This site was selected because the training initiatives will include competencies and performance objectives for employees.

The Community Colleges of Colorado (CCC) is providing leadership for this 2-year endeavor that involves 14 partner colleges with the local governing entities under a central office comprising an Executive Director and staff. Each of these colleges has a training division and an instructional division that designs and delivers learning to corporate and small business customers.

This grant has two major purposes. First, training services will be offered directly to incumbent workers at certain companies. Second, a state-level college training support system will enhance local company/employee services. Leaders of this grant expect that at least 4,350 incumbent workers will receive necessary services. Each community college is in a strong position to work collaboratively with industries, since they each have a business service unit on campus that includes experienced assessment and training staff as well as managers.

A major portion of the grant is dedicated to creating the Colorado State Training Solutions Center. This Center is envisioned to address employment issues by overseeing the creation, revision, and delivery of training modules needed by different companies. The Center will utilize an electronic storage and retrieval system so that their partners can have access to a wide range of materials for their use and modification. Since these materials are modularized and their delivery formats will be standardized, partners will be able to draw upon and assemble different types of modules into new course offerings. This system will foster a competency-based, modularized curriculum that supports both group and independent-learner models with various formats including instructor-led classroom training, Web-based instruction and performance support, CD-ROM, video, and audio.

The leaders of this initiative believe that the curriculum will serve as a model since it defines the creation and delivery of learning content through stated expectations of learning and performance and provides for the measurement of the results. Assessments are designed by the training curriculum designers and are intended to measure student learning before and after the delivery of modules. The types of learning assessments will include paper-and-pencil tests or demonstrations of learning through applied tasks. During the training experience, participants will be asked for feedback about whether the training material matches their needs. If it does not match, then the trainer will be able to revise the learning experiences to better fit employees' needs.

WESTERN GOVERNORS UNIVERSITY CASE STUDY
ABSTRACT

In the fall 1999 semester, five individuals were interviewed at Western Governors University (WGU). The purpose of this case study was to explore the competency-based degree programs in place at WGU. WGU is a newly incorporated institution that has dual missions for delivering competency-based degrees and brokering of distance-delivered education.

In 1995, governors of most of the western states working in conjunction with the Western Governors Association agreed to develop an accredited postsecondary educational entity. It would be designed to broker an array of distance-delivered learning opportunities from both traditional postsecondary providers and corporate providers to students across the country and the world. WGU offers competency-based programs of study that are designed to recognize knowledge and skills learned through work and life experiences. The certificates and degrees, especially those developed initially, support welfare-to-work initiatives as well as create opportunities for the geographically dispersed clientele of WGU. Their competency-based degrees actively allow students to integrate past experience and use it toward degree completion. It is believed that this accelerates student progress to graduation.

All WGU degrees are competency based and are predominately at the Associate of Applied Science and Associate of Arts levels. These degrees are most needed in the western region of the United States. The basic building blocks of WGU degrees are the individual competencies that consist of performance descriptions. These are the smallest unit of describable skills or knowledge upon which everything else is based. A domain consists of a collection of performance descriptions that corresponds to a body of knowledge roughly equivalent to a sequence of courses in a traditional degree program. Similarly, several domains (usually six or seven) compose a WGU degree. The initial developers of the WGU degree structures found that using competencies allowed for greater flexibility in program and degree design, making possible the linkage of subject matter in fresh combinations.

Program Councils comprising academic and corporate subject matter experts who oversee clusters of credentials in specific areas are responsible for the development of the curriculum. The Assessment Council evaluates student learning and progress, while the advisors are responsible for the development of the curriculum and mentors provide advising.

WGU seeks to integrate competencies during assessment, and therefore an assessment battery is typically used. This collection of assessment instruments is often developed by third parties and includes customized assessments built to WGU specifications. WGU follows accepted professional practice for establishing reliability and validity of these new instruments. A method of tracking student performance in the future and asking employers about their abilities is being planned.

PROFICIENCY-BASED ADMISSION STANDARDS SYSTEM (OREGON)
CASE STUDY ABSTRACT

This case study focuses on the Proficiency-based Admission Standards System (PASS) in the state of Oregon. The impetus for adopting a competency-based admission system in Oregon is to build on and integrate with K-12 systems that are increasingly competency driven.

In 1991 and 1995, the Oregon legislature adopted the use of the Certificate of Initial Mastery (CIM) at the 10th grade level and the Certificate of Advanced Mastery (CAM) at the 12th grade level. Both of these certificates focus on competencies necessary for student achievement. CIM requires achievement in English, math, social sciences, arts, and a second language. CAM requires achievement in the same academic areas plus generic, career-oriented competencies in personal management, problem-solving teamwork, communication, workplace systems, career development, and employment foundations, as well as application of academic knowledge in a work context. In response to these changes at the secondary level, the Oregon University System (OUS) in 1994 adopted a proficiency-based method for admission to colleges and universities in its system. PASS is to be phased in over a number of years, with full implementation expected with the entering class of 2005.

Oregon University System chose to adopt a proficiency-based system to increase the likelihood that students who are admitted to college will be able to succeed and to graduate in a timely fashion. Another reason to move toward this competency-based system is the increasing dissatisfaction with the reliability of grade point averages as proxies for student learning. Advocates of this new system believe that over time, proficiencies will be better measures of student learning. In addition, administrators would like to use PASS proficiencies and scoring in placement decision, too. Another suggested future outcome is that the Associate of Arts Oregon Transfer degree will eventually be defined by proficiencies rather than the credits now used, removing obstacles to seamless transitions along the path to the baccalaureate degree.

When fully implemented, PASS will require students to demonstrate proficiency in six subject areas—math, English, social science, science, visual and performing arts, and second languages. For each of these subject areas, there are 4 to 7 individual proficiencies for a total of 33 outcomes. PASS proficiencies are what students should know and be able to do.

Concerns of parents, students, and admissions officers center on transfer and articulating across postsecondary systems. These have been addressed by working with major out-of-state institutional receivers and providers of students. Agreements in principle have been reached with the University of California and California State University systems, the University of Washington, and private universities such as Stanford that have provided letters of support to PASS. Additional concerns focus on the award of financial aid and scholarship monies that are based on grade point averages and credits, as well as other requirements. Steps are being taken to address these issues.

FORD MOTOR COMPANY CASE STUDY
ABSTRACT

Five individuals from the Human Resources unit in the Ford Motor Company Headquarters in Dearborn, Michigan, were interviewed about their competency-based selection and training system. The Ford Motor Company produces cars and trucks. The company and its subsidiaries also engage in other businesses, including manufacturing automotive components and systems as well as financing and renting vehicles and equipment.

Ford Motor Company uses competencies in their selection, training, and promotion of global salaried employees. Ford defines competencies as an agreed-upon set of knowledge, skills, abilities, experiences, values, or personal characteristics that are necessary to run the business and achieve business objectives. The competency model that Ford developed was based upon a formal review of existing models in other companies. They performed an analysis of effective behaviors, particularly for managers. These competencies are clustered into three main areas that are considered important for leadership behaviors: (1) heart, (2) relationship, and (3) know-how. Each cluster is briefly defined by a few key terms. Then, there are four subcategories under each major category that further define specific competencies. Within the Human Resources System Infrastructure, these competencies guide several processes at several points in time. First, competencies are used as a basis to screen individuals who are recruited for positions. Second, competencies are formally assessed to identify who will ultimately be selected or hired to fill specific positions. Competencies are used to evaluate the performance of management. They also guide the design of training seminars and workshops. Finally, competencies are used to create development plans for leaders who aspire to make a lateral move within the company or seek a promotion.

Assessment of individuals' abilities at Ford begins with the recruitment of potential employees considered for professional positions. All candidates who pass the initial pre-screening must complete a job simulation that lasts about 3 hours. All of these assessments are designed by Ford employees and tailored to the specific job function as well as the competencies. Each team of candidates progresses through multiple assessments including a case of an actual business problem, a stressful role-play situation, and a group discussion about a particular problem. Professional staff members in an assessment center are trained for 2 days to learn how to evaluate the candidate's performance. At least two assessors evaluate each simulation, and a more highly trained coordinator supervises each pair of assessors. The coordinator is responsible for reviewing their assessments and then working with the raters to resolve any major differences in their ratings. There are no cutoff scores that are needed by candidates in order to be hired at Ford. However, if candidates scored at the very ineffective levels across all simulations and assessment, they most likely would not be hired. The Human Resources staff believe their training of assessors strengthens the reliability of their results. In addition, they are making progress toward predictive validity since they use actual problems that are encountered at Ford as the major assessments. The assessment system has not been in place long enough to reach strong predictive validity, but Human Resources staff view this outcome as possible with more experience over time.

8. APPENDICES A-I

A. King's College

B. Northwest Missouri State University

C. Sinclair Community College

D. Hagerstown Community College

E. Community Colleges of Colorado Incumbent Worker Project

F. Western Governors University

G. Proficiency-Based Admission Standards Systems (Oregon)

H. Ford Motor Company

I. Case Study Interview Protocol

APPENDIX A

King's College

Introduction

In the fall 1999 semester, 18 faculty were interviewed at King's College by the Working Group consultant. Each individual interview during the 3-day site visit lasted between 50 to 60 minutes. Participants were mostly full-time faculty representing different ranks (full, associate, and assistant professors). In addition, faculty leaders such as department chairs, team leaders of curriculum design, and senior administrators were interviewed. Numerous documents were reviewed by the consultant, including the college catalogue, published books, and selected chapters about King's College, as well as their most recent outcomes assessment periodic report submitted to the Middle States Association of Colleges and Schools. The purpose of this case study was to explore the competency-based educational system at King's College with a particular focus on the development of competencies and how they are assessed.

The Setting

King's College is an independent baccalaureate institution with an enrollment of 1,700 full-time students plus 600 part-time and graduate students. The student body consists of mainly undergraduates from Pennsylvania, New Jersey, New York, Delaware, Maryland, and Washington, D.C. Students also come from 14 different countries.

King's College offers primarily undergraduate educational programs in the humanities, the natural and social sciences, and specialized programs in business and other professions. King's College is rooted in the tradition of Judeo-Christian humanism and seeks to educate the whole person (King's College, 1999a).

The general education curriculum at King's College during the 1970s gave students many choices and only vaguely defined its educational philosophy (Farmer, 1988). The curriculum did not articulate specific learning outcomes expected of students. This curriculum was perceived by many faculty to be a smorgasbord of learning with fragmented experiences that lacked strong connections among the individual courses.

Since faculty grew increasingly dissatisfied with the distribution form of general education, they decided to design a new general education core curriculum with a particular focus on student outcomes. The curriculum committee decided that this new curriculum should consist of all newly designed courses (Farmer, 1988). All new courses were created by faculty project teams comprising faculty from more than one discipline (Farmer, 1999a). The project teams were empowered to make recommendations and implement the changes into action. The academic vice president deliberately developed teams rather than committees because committees are often viewed by faculty as having an emphasis on protecting territorial interests of their own department or academic program (Farmer, 1999b). Frequently, committees make recommendations and then others actually implement the ideas. Teams are more fully committed to conceptualizing new ideas and then actually striving to incorporate actions into the culture of the institution.

Identifying Important Outcomes

Faculty initiated their work by discussing and then reaching a consensus about the desired student learning outcomes. After these outcomes were defined, the faculty identified the course content most appropriate to link with those outcomes.

In 1985, the King's College faculty implemented a core curriculum designed to provide students with a common learning experience in the liberal arts and sciences, so that students could develop the following specific skills of liberal learning:

- Critical thinking;
- Effective writing;
- Effective oral communication;
- Library and information literacy;
- Creative thinking and problem solving;
- Moral reasoning;
- Computer literacy; and
- Quantitative reasoning.

All courses in the core curriculum were designed for nonmajors (Farmer, 1988). The faculty believed that this new core curriculum would be vital to promote a stronger coherence and integrity of knowledge within this new structure. Each liberal learning category had clear, specific goals and objectives for all courses within it. These goals and objectives included numerous connections between the liberal learning categories (King's College, 1999a).

King's College faculty believed that an undergraduate education helps students to view learning as cumulative, transferable, and integrated. Therefore, faculty developed competency growth plans for each academic program. They defined each transferable liberal learning skill within the context of the major and then divided the skill into specific competencies for students to develop from the freshman year through the senior year in both the general education core and major courses. Each plan included a definition of each competency, an indication of courses and assignments that were designed to help students develop the competency, and specific criteria faculty and students use to gauge the quality of student performance. Attachment A-1 is an actual example from the accounting department that is currently used for their accounting majors. These plans are guides for faculty and students. The main concepts were frequently reinforced in syllabi and instructions for course assignments.

Faculty derived these competencies mainly from their own experiences within the field; they learned how to write specific, clear criteria from special educational workshops that they have attended at King's College. Faculty development was a serious endeavor, and professors were encouraged to participate in an ongoing series of seminars during the summer or a particular semester. The goal was to help faculty gain self-confidence and to be prepared professionally to implement their new ideas. Group training for faculty in computer literacy, critical thinking, or writing across the curriculum were some of the development work necessary for faculty to become responsible for the total education of their students (Farmer, 1988).

Assessment Strategies

The main purpose of assessment at King's College was to enhance student learning by focusing on improvements rather than comparing programs. The main questions that faculty sought to answer were:

- What should students know?
- How well are they learning it?
- How does the institution know?

King's College adhered to the four tenets of the 1990 Middle States Association Framework for Outcomes Assessment:

- Students hold the major responsibility for their own learning;
- Teaching plays a significant role in facilitating student learning;
- Campus climate plays an important role in promoting both learning and teaching, especially in terms of student development; and
- Equity and diversity in campus life contribute to the success of teaching and learning (King's College, 1999a).

Assessment at King's College was primarily course-embedded and provided students with clearly defined expectations, personalized feedback on growth, and timely indications of areas needing attention (King's College, 1999a). Faculty obtained the information needed to identify and respond to the strengths and weaknesses of individual students, of teaching/learning strategies, and of curricula.

The assessment program helped faculty to create an integrated plan for cumulative learning. Faculty critically evaluated these cumulative plans systematically to determine if there was a need to update or revise them. For example, the faculty in the College of Arts and Sciences identified the problem of outdated computer competence growth plans (King's College, 1999b). Each department was working on developing new technology growth plans to reflect the essential learning outcomes that all college students should achieve. These discussions also led to revisions in the curriculum, including the decision of the English department faculty to add an elective course in desktop publishing to their curriculum.

The faculty traditionally rejected standardized, longitudinal assessments of student learning using commercially available instruments since they found that students do not take these types of external assessments seriously and they do not measure all of the areas faculty believe are important. Course-embedded assessments motivated students to take these evaluations seriously, and they are motivated to perform at their highest levels since the outcomes will count toward their grades (Farmer, 1999b). However, in the 1999–2000 academic year, commercially available standardized instruments will be pilot tested to determine if they address concerns raised by some faculty who want quantitative data to provide benchmarks or external reference points for making comparisons. The initial pilots will be focused on critical thinking, since it is a main priority of both general education and major programs (King's College, 1999b).

King's College faculty designed all of their own assessments. They administered assessments and evaluated student learning within individual courses. Faculty primarily used qualitative assessment strategies defined by criteria conceptualized as a developmental plan of learning for students. These criteria helped faculty judge student performance. Since qualitative assessment activities were actually designed by the faculty, they reflected more closely what was actually being taught by faculty and being learned by students (King's College, 1999b).

Several major components made up King's College comprehensive assessment program. Faculty in the core curriculum designed course-specific assessments (either individually or collegially) by creating exercises to understand how well students think and communicate. These may be administered at the beginning and at the end of the general education core courses. Specific assignments within the context of courses may also be used for assessment purposes. For example, faculty may give students a pretest at the beginning of a critical thinking course and then incorporate an assessment activity as part of the final exam in the same course.

The sophomore-junior diagnostic project was used by departments or programs as a screening exercise to determine each student's ability in his/her major field of study regarding mastery of content and methods within the discipline. It also provided useful assessment of the student's ability to apply the transferable liberal learning to a project within his or her major field of study (King's College, 1999b). Faculty in each major designed a project that was related to the major field and is usually embedded in a required second semester sophomore or first semester junior-level course. This midpoint assessment enabled faculty to measure the student's likelihood of success in the major.

The culminating component of the King's College curriculum was the senior integrated assessment (King's College, 1999b). Faculty in each department created an activity that allowed students to demonstrate their mastery of subject matter and the methods of the major field as reflected in departmental goals of liberal learning articulated for seniors in the department's competence growth plan. These assessment activities frequently included exhibits, lectures, or other kinds of public presentations where other students, faculty, and the public are invited to attend. All undergraduates completed this assessment, which served to demonstrate the students' readiness to function at an effective level to meet the expectations of the King's College faculty and the expectations of employers in the workforce.

Documenting Student Achievement

Faculty project teams for general education and departmental faculty for major programs were responsible for submitting assessment documentation. The reporting requirements included:

- "A description of the assessment activity;
- Criteria students are given in writing before the assessment;
- Samples of student performance at three levels—superior, satisfactory, less than satisfactory but still acceptable—with names of students deleted, but with feedback to students included;
- A report of the number of students performing at each level; and
- An explanation of how assessment results will be shared with faculty on a project team or in the department" (King's College, 1999b, p. 32).

The work of the core curriculum project teams was supervised by the Dean of the College of Arts and Sciences and was reviewed by the Curriculum and Teaching Committee of the Faculty Council. Some faculty developed common criteria for all sections of certain individual core general education courses. Effective assessment criteria should reflect the following characteristics:

- "Communicate to students in writing avoiding ambiguous language;
- Relate directly to faculty expectations for student learning at the appropriate level from freshman to senior year of study;
- Reflect the significant aspects of learning in a discipline avoiding what is trivial or petty;
- Are sufficiently specific in nature to permit student and teacher to monitor progress in building strengths and repairing weaknesses;
- Provide the basis for giving feedback to students and encouraging a continuing discussion; and
- Encourage students to engage in self-assessment and to take more responsibility for their own learning" (Farmer, 1999b).

The project teams recorded across all sections of a course the number of students scoring on the assessment at the highest, mid-level, and "needs improvement" (King's College, 1999b). Three copies of each assessment (representing each of the three levels) administered by a project team were retained with the specific criteria that faculty use to evaluate student performance. Project team members reviewed each other's work for the purpose of enhancing inter-rater reliability based upon the use of common criteria. The members of the project team attempted to identify common student problems and used assessment results as a foundation to create strategies to strengthen student learning (Farmer, 1999b). Faculty in academic programs also followed this approach. They were supervised by their department chairpersons, and the relevant dean reviewed the assessment findings with chairpersons on an annual basis.

The documentation material was available to external evaluators who could review and make judgments in arriving at consensual validation regarding whether the faculty had established criteria at a sufficiently high enough level to be appropriate at the freshman through the senior years. Secondly, it could be determined if faculty are honest in the application of their own criteria (King's College, 1999b). The regular, cyclical collection of student assessment results gave project teams and departmental faculty opportunities to discuss the findings in relation to course content and sequence.

Data Ramifications

The majority of assessments of student learning were embedded within existing coursework both in general education and the major programs. Some faculty used common assessments in the general education courses, while others used different approaches.

Most general education courses included a pre- and post-assessment that helped faculty to determine if there were gains in student learning. The assessment documentation required for all programs was available to external evaluators to review and to make judgments about the quality

of information. Such a process can help strengthen validity since external evaluators can examine if "the criteria have been established at a level sufficiently high enough to be appropriate at the freshmen through senior years and if faculty have been honest in the application of their own criteria" (King's College, 1999b, p. 33). In addition, faculty in the major programs formally evaluated the sophomore-junior diagnostic projects and senior integrated assessments to determine the highest levels of performance, the mid-level, and those students who need improvement. The assessment results, including samples of actual student performances, were formally shared with faculty and administration. Project team members reviewed each other's work to enhance inter-rater reliability based upon the use of common criteria.

Advantages and Challenges Associated with a Competency-Based Educational System

In the core general education curriculum, project teams frequently used common assessment activities in multiple sections of certain courses. This approach facilitated an extensive discussion of the assessment findings (King's College, 1999b). Based upon the assessment results, a couple of faculty teams made key decisions about revising their goals, prompted discussion about teaching strategies among teams, and helped three additional teams determine whether their courses had been successful. For example, in the general education Civilization course, the project team decided to revise the pre- and post-assessments for this course since the multiple-choice tests did not reveal if students had met the higher order reasoning expectations for studying history on the college level. A new qualitative assessment activity was being pilot tested to determine if students expanded their knowledge of historical information, were able to correlate these facts with cause and effect, and possessed an understanding of historical significance (King's College, 1999b). By contrast, the project teams who did not use common assessment activities reported that they did not discuss assessment findings.

Most department chairpersons believed the sophomore-junior diagnostic project to be the most valuable component of the assessment model, since department faculty had useful information to determine the effectiveness of the first 2 years of education at King's College (King's College, 1999b). This project also helped faculty to identify students who needed help at an early stage so that there was time to intervene effectively to help students overcome specific challenges. These plans particularly helped build students' skills for their advanced courses since undergraduates were repeatedly working on these skills in multiple courses each year. Faculty believed that students effectively mastered key skills that were particularly important in the workplace.

Through focus groups, students stated that they found course syllabi were more detailed and more directed toward student learning, and they liked knowing early the criteria faculty would use to judge their performance (Farmer, 1999b). In addition, students believed there were increased opportunities for them to have more meaningful interactions with faculty, and they had greater awareness of their sequential growth and development as learners.

A major challenge associated with developing this type of system was that it took a considerable amount of time. King's College did not attempt to change everything at one time. An incremental approach was taken whereby important changes were broken down into a series of discrete processes that occurred over time. In addition, the strategy of pilot-testing desired changes helped to encourage faculty to try these new ideas since they knew there would be opportunities for revisions (Farmer, 1988).

Recommendations for Other Colleges and Universities

Other colleges and universities may be interested in adopting or tailoring the assessment program at King's College to their own institution. Nearly all faculty agreed that it would be very difficult to adopt an identical form with the same definitions of liberal learning competencies at other colleges. However, the structure and process used at King's College may be transferable to other institutions. For example, all faculty in major programs could be asked to identify the objectives for student learning, to indicate which courses will address these objectives and how they will be assessed, and to state very specific assessment criteria. In addition, faculty at other colleges could consider which particular strands of liberal learning (such as critical thinking or effective writing) should be emphasized in all majors and within certain upper level courses too. This does not mean that all courses should be designed to accomplish all liberal learning goals; rather, departmental faculty could make a commitment to focus on certain goals in numerous courses in their own major program. The benefit is that students continue to practice and build upon their own skills, frequently applying them to different contexts.

In order for a model similar to King's College systemwide change to be adopted, there were several key recommendations that faculty strongly advocated. First, faculty development was essential. At King's College, the faculty development plan was more extensive than merely bringing an occasional speaker once a year. Faculty worked on one particular outcome rather than trying to do everything at one time. For example, there was a course offered during the entire semester about critical thinking, which faculty were strongly encouraged to attend. Getting faculty motivated to participate can be a challenge. Faculty believed the system at King's College worked well, especially since incentives included getting release time from a course or being paid a stipend to develop and participate in faculty development during the summer months. These types of compensations helped faculty to get the necessary time and develop expertise to redesign their courses. Most faculty believed this type of system was critical to the success of this endeavor.

Another key factor was strong leadership and support by the central administration. The academic vice president was often described as being very passionate about this competency-based work. He publicly thanked individuals and maintained open and frequent communications with colleagues. Professors emphasized that faculty ownership for this competency-based education system is very important, and that it exists at King's College. However, they credited the academic vice president for providing the vision and guidance for conceptualizing and helping the implementation of these innovations to be successful. The leadership was clearly not authoritative. Conditions of trust and an environment open to experiments (often through pilot studies) was supported by the leadership. In addition, faculty highly valued the multiple opportunities to present their work on campus or at national conferences and to participate in faculty development seminars.

Conclusion

The King's College faculty shifted their emphasis from instruction and teaching to a focus on producing learning. Faculty in the core and major programs worked together to articulate sophisticated plans that clearly document their intentions in terms of specific competencies for each particular course, strategies for assessing them, and the specific assessment criteria that will be used.

Faculty usually have ideas about what they want students to learn, but it may be rare for them to formally share their specific expectations with students. At King's College, the "very act of writing such criteria has helped faculty to sharpen their understanding as well as to become clearer about their objectives for student learning in the classroom" (Farmer, 1991, p. 32). Students also knew as beginning freshmen that the faculty in their major programs would have clear expectations for their learning that built upon the liberal learning skills gained in the general education core curriculum.

Most faculty at King's College adopted the learning paradigm requiring faculty to change their role from being the authorities and sources of all right answers to being guides and facilitators to help students discover potential solutions to complex issues found in society today. The faculty were highly committed to continuously strengthen and refine their innovative curriculum as well as the assessment process.

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Attachment A-1

KING'S COLLEGE
COMPETENCY GROWTH PLANS FOR ACCOUNTING MAJOR[1]

A. CRITICAL THINKING COMPETENCY.

Students majoring in Accounting will be able to apply critical thinking skills in preparing and analyzing financial statements, preparing budgets, making managerial decisions, preparing audit programs, and writing audit reports.

B. EFFECTIVE WRITING COMPETENCY.

Students majoring in Accounting will be able to apply effective writing skills to the preparation and analysis of financial statements, audit programs, audit reports and tax opinion letters.

C. EFFECTIVE ORAL COMMUNICATION COMPETENCY.

Students majoring in Accounting will be able to make oral presentations that are clear, technically accurate, complete, properly organized and effectively delivered.

D. LIBRARY AND INFORMATION TECHNOLOGY COMPETENCY.

Students majoring in Accounting will be able to plan and implement search strategies so as to identify and use major reference tools appropriate to Accounting.

E. COMPUTER COMPETENCY.

Students majoring in Accounting will be able to use computer technology utilizing commercial accounting software, spreadsheets, word processing, computer supported presentations and appropriate research techniques including CD-ROM and the Internet.

F. QUANTITATIVE REASONING COMPETENCY.

Students majoring in Accounting will be able to make decisions utilizing proper quantitative methods appropriate to the subject matter of the decision.

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KING'S COLLEGE[2]
SCHEDULE OF ASSESSMENTS FOR MAJORS IN ACCOUNTING

	FRESHMAN	SOPHOMORE	JUNIOR	SENIOR
CRITICAL THINKING	CORE 100-Critical Thinking	ACCT 260-Intermediate Accounting I ACCT 270-Intermediate Accounting II	ACCT 310-Advanced Accounting ACCT 320-COST Accounting	ACCT 410-Auditing
EFFECTIVE WRITING	CORE 110-Effective Writing	ACCT 270-Intermediate Accounting II	ACCT 310-Advanced Accounting	ACCT 420-Tax Accounting
EFFECTIVE ORAL COMMUNICATION	CORE 115-Effective Oral Communication	ACCT 270-Intermediate Accounting II	ACCT 370-Accounting Information Systems	BUS 340-Business Law I BUS 345-Business Law II
LIBRARY AND INFORMATION LITERACY	CORE 100-Critical Thinking CORE 110-Effective Writing	ACCT 270-Intermediate Accounting II	ACCT 310-Advanced Accounting	ACCT 410-Auditing
COMPUTER COMPETENCY	CORE 110-Effective Writing BUS 121-Computer Applications in Business	ACCT 260-Intermediate Accounting I	ACCT 370-Accounting Information Systems	ACCT 420-Tax Accounting
QUANTITATIVE REASONING	MATH 121-Calculus I	ACCT 270-Intermediate Accounting II	ACCT 320-Cost Accounting	ACCT 410-Auditing
SOPHOMORE/JUNIOR DIAGNOSTIC PROJECT		ACCT 270-Intermediate Accounting II	ACCT 310-Advanced Accounting	
SENIOR INTEGRATED ASSESSMENT				ACCT 410-Auditing

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KING'S COLLEGE

COMPETENCY GROWTH PLAN IN CRITICAL THINKING FOR STUDENTS MAJORING IN ACCOUNTING

FRESHMAN

COMPETENCY DESCRIPTION	STRATEGY	ASSESSMENT CRITERIA
The student will be able to: 1. Distinguish an argument from a set of claims that are not inferentially related. 2. Distinguish the functions of language to express and influence meaning. 3. Distinguish the kinds and purposes of definitions. 4. Distinguish between validity and soundness, as they are related to deductive arguments and to evaluate the strength of inductive and rhetorical arguments. 5. Recognize the common fallacies in everyday reasoning. 6. Recognize and assess reasoning in various fields: business, law, science, the arts, etc. 7. Present arguments effectively in oral and written form.	**Core 100: Critical Thinking** In addition to taking three major tests and performing textbook exercises, the student will complete two major writing assignments. 1. A critical analysis and evaluation of an extended argument. 2. An argumentative essay in which the student generates an argument on a controversial topic.	1. The student demonstrates recall and understanding of the pivotal concepts and processes of reasoning. 2. The student identifies an argument and distinguishes support from conclusion. 3. The student identifies language problems, such as ambiguity, vagueness, and emotionally loaded language. 4. The student identifies crucial fallacies in arguments. 5. The student summarizes and reconstructs an argument contained in an extended prose passage. 6. The student draws appropriate inferences from given data. 7. The student recognizes hidden assumptions and implied premises and conclusions of an argument. 8. The student distinguishes subarguments from the main argument in a prose passage. 9. The student separates a problem into discrete units and sets forth evidence in separate, meaningful categories.

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FRESHMAN

COMPETENCY DESCRIPTION	STRATEGY	ASSESSMENT CRITERIA
		10. The student uses the results of appropriate research (library, expert opinion, survey, poll, experiment, etc.) in the analysis, construction, and evaluation of arguments. 11. The student identifies and explains the reasoning process applied to various disciplines and demonstrates that process by constructing a strong argument in one of those fields, preferably his or her major discipline. 12. The student recognizes and performs the basic functions of reasoning. 13. The student chooses and defends an appropriate course of action from among a number of possible alternatives. 14. The student relates an argument to broader issues and concerns. 15. The student evaluates the acceptability of premises, their relevance to a conclusion and the adequacy of their support of that conclusion.

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SOPHOMORE

COMPETENCY DESCRIPTION	STRATEGY	ASSESSMENT CRITERIA
The student will be able to: Define and explain the components and structure of the four financial statements: Balance Sheet, Income Statement, Statement of Cash Flows and Statement of Retained Earnings. Analyze the above statements, draw relevant conclusions about the individual or company, and communicate the results through written and oral techniques. Provide financial information that is useful in investment, credit and similar decisions along with information about a company's resources, claims to those and changes in them.	**ACCT 260/270: Intermediate Accounting I and II** • Preparation of homework assignment related to the four major financial statements. • Examinations consisting of problems and questions designed to encourage an understanding of the financial position and results of operations for a company. • Students present a financial analysis of a corporation.	1. The student defines, explains and distinguishes the content, organization, and purpose of the four major financial statements. 2. The student reviews the structure and content of the four financial statements and communicates this analysis. 3. The student calculates financial ratios designed to evaluate liquidity, leverage activity, profitability and market strength of a particular company. 4. The student applies horizontal and vertical analyses of various balance sheets and income statements and draws proper conclusions. 5. The student identifies, measures and summarizes the relevant data needed to properly record and present the results of operations and the financial position of the company. 6. The student reflects upon their learning and discusses issues related to financial accounting with their fellow students as part of the Sophomore-Junior diagnostic project.

APPENDIX B

Northwest Missouri State University

Introduction

In the spring 2000 semester, seven faculty were interviewed at Northwest Missouri State University (NMSU) by the Working Group consultant. Each individual interview during the site visit lasted between 50 to 60 minutes. Participants were mostly full-time faculty representing different ranks (full, associate, and assistant professors), and two individuals provided major leadership for assessment. Numerous documents were reviewed by the consultant, including the college catalogue and other relevant documents shared by the participants. The purpose of this case study was to explore the competency-based educational system at Northwest Missouri State University with a particular focus on the development of competencies and how they are assessed.

There are several specific dimensions of the competency-based educational approach that will be illustrated in this case study. First, an overview of competencies in general education will be outlined as required by the state (for systemwide transfers) and then linked to NMSU. Second, the assessment work at the university as well as documentation requirements will be outlined. Finally, a statewide writing consortium will be highlighted.

The Setting

Northwest Missouri State University is a moderately selective, learner-centered regional institution offering a focused range of undergraduate and graduate degree programs (NMSU, 1998). It is located in a rural community of approximately 10,000 individuals. Historically, the university serves 19 different northwest Missouri counties, emphasizing agriculture, business, and education programs. The university, accredited by the North Central Association of Colleges and Universities, offers bachelor's, master's, and specialist in education degrees as well as 1- and 2-year certificate programs.

The current student enrollment is approximately 6,200 students. Approximately 5,200 undergraduates and 1,000 graduate students are working toward 98 undergraduate degrees, 26 master's degrees, 4 education specialist degrees, and a cooperative doctoral program in educational leadership. Ninety percent of the student body are undergraduates, and 50 percent live in on-campus housing. The median age is 19, and only 12 percent are married. Fifty-eight percent of these students are female, and 50 percent are first-generation college students.

Northwest is committed to providing students with a strong general education core to prepare undergraduates for a dynamic world. The university is a national leader in applying information technology to the learning processes and in promoting continuous quality improvement to enhance performance across major functions and activities (NMSU, 1998).

Northwest was the only degree granting college or university selected for a site visit as part of the prestigious Malcolm Baldridge Quality Award Program. In November 1997, the school was honored for its extraordinary achievements in applying quality improvement principles to its operations with the Missouri Quality Award in Education.

The university has embraced a set of core values that are outlined in the catalogue:

- "High expectations are the starting point for quality;
- Quality education is talent development;
- Learning is an active, not passive, process;
- Assessment must link process improvement to individual achievement;
- Instruction should be learner-centered and holistic, challenging students to utilize levels of cognition and to develop physically, socially, and ethically;
- The living/learning environment must be aligned with the academic goals of the University;
- An effective curriculum promotes sustained interaction and teamwork among students, faculty, and staff;
- The nurturing, development, and empowerment of employees at all levels are critical to a quality living/learning environment; and
- Ethical behavior will be modeled and promoted by the University" (NMSU, 1998, p. 8).

In 1987, the senior leadership (University President and Provost) initiated the "culture of quality program." In 1992, Northwest continued to promote their quality program by following the Malcolm Baldrige National Quality Award criteria as a conceptual framework to discuss quality and as a template for planning and agenda setting (Hubbard, 1999). This was introduced as a master plan to revitalize undergraduate education. The culture of quality plan was developed by identifying 42 best practices and resulted in specific actions to improve processes. Northwest created its culture based on the educational research work of Alexander Astin's definition of quality defined as talent development. Success is measured by the value that is added to students, faculty, staff, and the region.

Identifying Important Outcomes: Influence of Statewide Policy

The Coordinating Board for Higher Education (CBHE) in Missouri oversees higher education for the entire state. CBHE "fosters a public policy framework that is committed to the values of access, quality, and efficiency for the state's higher education system. As Missouri continues to increase aspiration and performance levels for all students, it will require an educational system that is responsive to the needs of students for easy mobility across institutions" (Missouri General Education Steering Committee, 2000, p. 1).

The Coordinating Board for Higher Education believes that each college and university in the state should be responsible for establishing and maintaining standards of expectations for all students completing its courses, programs, certificates, or degrees. However, CBHE values an effective and efficient transfer of credits between and among its institutions to create a high quality, statewide system of higher education. For this reason, the General Education Steering

Committee of CBHE has set forth statewide general education policies that directly affect and influence general education at Northwest Missouri State University. This policy articulates "a rationale for general education; defines the responsibilities of institutions, faculty, and students for general education; and promotes broad curricular goals and student competencies that should result from institutional general education programs" (Missouri General Education Steering Committee, 2000, p. 3). Through these policies, CBHE expects to facilitate student transfers to ensure the portability of general education credit among Missouri's colleges and universities. The Missouri General Education Steering Committee views general education as the curricular foundation that "encourages students to acquire and use the intellectual tools, knowledge, and creative capabilities necessary to study the world as it is, as it has been understood, and as it might be imagined. It also furnishes them with skills that enable them to deepen that understanding and to communicate it to others. Through general education, the academy equips students for success in their specialized areas of study and for fulfilled lives as educated persons, as active citizens, and as effective contributors to their own prosperity and to the general welfare" (p. 3).

Each institution is expected to ensure the transferability of general education credits among Missouri institutions. Faculty at each college or university specify and publish a 42-semester-hour block of general education credit that will be considered equivalent to corresponding blocks of credit at other public and signatory institutions in enabling students to achieve these general education goals and competencies (Missouri General Education Steering Committee, 2000, p. 4).

CBHE defines goals as the "curricular intent of state policy regarding the academic skills and knowledge content of general education" (p. 4). Competencies consist of the illustrative state-level expectations for student performance in general education. Faculty (at each college or university) design a general education program that fits their mission and meets the state-level curricular goals. Faculty also must specify institution-level competencies that will follow from achieving these curricular goals and are in alignment with the suggested competencies created by CBHE. CBHE in turn has articulated state-level curricular goals and institution-level student competencies for general education in two categories: academic skills and knowledge. The specific skills include communicating, higher order thinking, managing information, and valuing. The knowledge areas include social and behavioral sciences, humanities and fine arts, mathematics, and natural sciences. Two examples from each category are outlined below. The statewide general education policy, including the types of examples listed below, was formally adopted on June 8, 2000, by the Missouri Coordinating Board for Higher Education.

Two Examples of Skills Required by CBHE[1]

Communicating

State-level goal: To develop students' effective use of the English language and quantitative and other symbolic systems essential to their success in school and in the world. Students should be able to read and listen critically and to write and speak with thoughtfulness, clarity, coherence, and persuasiveness.

Suggested competencies: Students will demonstrate the ability to:

- Analyze and evaluate their own and others' speaking and writing;

[1]This material can be found on the Missouri Coordinating Board Web Site. See http://www.mocbhe.gov/acadafrs/gepolicy.htm

- Conceive of writing as a recursive process that involves many strategies, including generating material, evaluating sources when used, drafting, revising, and editing;
- Make formal written and oral presentations employing correct diction, syntax, usage, grammar, and mechanics;
- Focus on a purpose (for example, explaining, problem solving, argument) and vary approaches to writing and speaking based on that purpose;
- Respond to the needs of different venues and audiences and choose words for appropriateness and effect;
- Communicate effectively in groups by listening, reflecting, and responding appropriately and in context; and
- Use mathematical, statistical models, standard quantitative symbols, and various graphical tactics to present information with clarity, accuracy, and precision.

Higher order thinking

State-level goal: To develop students' ability to distinguish among opinions, facts, and inferences; to identify underlying or implicit assumptions; to make informed judgments; and to solve problems by applying evaluative standards.

Suggested competencies: Students will demonstrate the ability to:

- Recognize the problematic elements of presentations of information and arguments and to formulate diagnostic questions for resolving issues and solving problems;
- Use linguistic, mathematical, or other symbolic approaches to describe problems, identify alternative solutions, and make reasoned choices among those solutions;
- Analyze and synthesize information from a variety of sources and apply the results to resolving complex situations and problems;
- Defend conclusions using relevant evidence and reasoned argument; and
- Reflect on and evaluate their critical thinking processes.

Two Examples of Knowledge Areas Required by CBHE[2]

Social and behavioral sciences

State-level goal: To develop students' understanding of themselves and the world around them through the study of content and the processes used by historians and social scientists to discover, describe, explain, and predict human behavior and social systems. Students must understand the diversities and complexities of the cultural and social world, past and present, and come to an informed sense of self and others.

Suggested competencies: Students will demonstrate the ability to:

- Explain social institutions, structures, and processes across a range of historical periods and cultures;

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- Develop and communicate hypothetical explanations for individual human behavior within the large-scale historical and social context;
- Draw on history and the social sciences to evaluate contemporary problems;
- Articulate the interconnectedness of people and places around the globe;
- Describe and analytically compare social, cultural, and historical settings and processes other than one's own; and
- Describe and explain the constitutions of the United States and Missouri.

Humanities and fine arts

State-level goal: To develop students' understanding of the ways in which humans have addressed their condition through imaginative work in the humanities and fine arts; to deepen their understanding of how that imaginative process is informed and limited by social, cultural, linguistic, and historical circumstances, and to appreciate the world of the creative imagination as a form of knowledge.

Suggested competencies: Students will demonstrate the ability to:

- Describe the scope and variety of works in the humanities and fine arts (for example, fine and performing arts, literature, and speculative thought);
- Explain the historical, cultural, and social contexts of the humanities and fine arts;
- Identify the aesthetic standards used to make critical judgments in various artistic fields;
- Develop a plausible understanding of the differences and relationships between formal and popular culture; and
- Articulate a response based upon aesthetic standards to observance of works in the humanities and fine arts;

All Missouri public colleges and universities, as well as independent or proprietary institutions that are "signatory to the statewide credit transfer policy, are expected to develop and post (both on the CBHE Web Site and their own institution's Web Site) the curricular design and assessment plan indicating how that institution plans to implement and assess general education" (Missouri General Education Steering Committee, 2000).

A general education transfer policy has been in place since 1987. A comparison of the "old" policy adopted in 1987 with the proposed current version (that will most likely be implemented) reveals some changes in the following areas. Originally, in 1987, only 39 credit hours were required in the lower division core curriculum. Now, 42 credit hours are proposed. In the original policy, there was no explicit statement of rationale for general education. The current proposal articulates an explicit rationale for general education. In the 1987 policy, programs could be distributional, topical, or thematic. However, there were no explicit goals or objectives of general education. The current proposal has shifted toward giving faculty flexibility to design programs, but they must be aligned with eight explicit and prescribed state-level general education goals.

"While each goal is accompanied by a list of specific student competencies, these competencies are for illustrative purposes. Faculty may substitute institution-level competencies for each goal that fits the ethos and mission of their respective institution" (Missouri General Education Steering Committee, 2000). Finally, in 1987 faculty of each institution could control their general education program. The current policy allows faculty to design their own general education curricula, but they must designate a 42-semester-hour block of transferable general education credit designed to meet state goals.

Identifying Important Outcomes: Northwest Missouri State's Approach

Currently, all employees at Northwest Missouri State embrace the student-centered culture of the quality framework. In the early 1980s, faculty and administrators wanted to better address the needs of students and other stakeholders. Therefore, in 1987, a master plan was introduced to revitalize undergraduate education. This plan was developed by identifying the 42 best practices and resulted in specific actions to improve processes at NMSU. The University now has a shared set of values that mainly focus on exceeding student expectations and striving for continuous learning and improvement at all institutional levels.

Students, including those who have completed programs and those currently enrolled, are the main customers. Stakeholders include employers, professional schools, graduate schools, and other organizations that may benefit from NMSU alumni.

The President of NMSU surveyed Chief Executive Officers of major national corporations through a Delphi process to determine the knowledge and skills that undergraduates need to be effective in the workplace. The results from this survey were incorporated into the specific university Key Quality Indicators (KQIs) or competencies outlined below:

1. **Communication**—Goals are to generate researched writings that develop and organize a valuable central idea; use writing processes successfully to invent, plan, draft, revise, and edit; comprehend presentational and interpersonal messages; use critical and empathetic listening; prepare and perform informative and persuasive speeches; understand and appreciate literature and its study; and apply basic literary methods in readings, discussions, and writings.
2. **Problem solving, critical and creative thinking**—Goals are to interpret, evaluate, and understand scientific information and processes and their applications; understand the historical and modem relationship among science, society, and life experiences; apply appropriate analytic geometric and/or statistical skills; use formula, data analysis, information, events, and/or graphic representation to make allocation decisions or solve other problems with numerical answers; access relevant data needed to solve problems; recognize/create strong arguments/theses/narratives; and use abstract paradigms/models to analyze, interpret, and evaluate data/ information.
3. **Computer**—Goals are to understand how computers and emerging, related technologies impact society; and to use computers and related technologies in their disciplines and everyday life.
4. **Self-directed learning**—Goal is to empower student to become a lifelong learner.

5. **Competence in a discipline**—Goals are to gain in-depth study of a major field of investigation while gaining the competencies required of all graduates, and to develop an understanding of the discipline and how it relates to society.
6. **Personal and social**—Goals are to relate to and interact effectively with others and be able to adapt to a variety of social and work environments; manage their personal affairs and contribute positively and productively to society; and explore their personal values, talents, interests, and aspirations with respect to lifelong goals.
7. **Multicultural**—Goals are to have an awareness of cultural diversity; develop the ability to interact with various cultures; and develop an appreciation for various manifestations of culture.
8. **Cultural enrichment**—Goals are to have an appreciation and understanding of the arts including the artist and the creative process as they affect and reflect society; have a desire to participate in aesthetic experiences; learn and evaluate literature from student's own culture; and learn and evaluate literature from other cultures.

In addition, the university seeks to foster a culture of commitment to service with the following attributes:

- Treating individuals with respect, fairness, and honesty;
- Performing tasks with competence and skill;
- Communicating clearly and courteously the services provided;
- Listening actively to requests, comments, and concerns;
- Being flexible and open to new ideas;
- Providing what is agreed upon to deliver in a timely manner; and
- Maintaining a safe and orderly, healthy, well-functioning, and attractive campus.

Formal feedback is also gathered from numerous advisory boards as well as from national studies of employer expectations. Many departments have their own advisory councils that serve to validate the KQIs. This validation is important since it serves as a mechanism to address the requirements and expectations that employers will have for new graduates in the work place.

The faculty are currently reviewing their own general education program to identify how their existing curricula fit with and actually map onto the requirements outlined above by CBHE. The faculty will specifically be examining whether there are any gaps that need to be addressed by their own general education program.

Responsibility for tracking and implementation of the key quality indicators is conducted by the General Education Continuous Quality Improvement Advisory Group, which has been formalized as the General Education Subcommittee of the Faculty Senate's Curriculum Committee. Academic departments are responsible for implementing and keeping track of their own KQIs. However, the eight competencies outlined above must cut across both general education and academic programs.

Assessment Strategies at Northwest Missouri State University

The overall assessment plan is coordinated by the Director of Assessment, Information, and Analysis. This office consists of two full-time staff and one graduate assistant. In addition to this staffing pattern, the university spends about $55,000 on assessment-related activities.

There are numerous assessment strategies that faculty use to determine if students are mastering the expected competencies. These assessments include both direct and indirect measures. Some measures are locally developed instruments, while others are standardized tests. Some assessments are common for all students, while faculty may design their own individual assessments for their particular courses. In this section, a brief review of major assessments will be presented.

Commercially Developed Instruments

Undergraduates are required to take the Academic Profile (the short form) published by the Educational Testing Service. This instrument assesses college-level reading, critical thinking, and writing mechanics within the context of material from the humanities and the social and natural sciences.

The university gets one report of the entire group's results. Currently, the assessment director is experimenting with breaking down the results into subgroups by academic departments. They are beginning this new method of examining results and do not have information yet on the usefulness of this approach, but the overall group scores for the Academic Profile have increased somewhat from spring 1998 to fall 1999. All seniors must take this test in order to register for their classes. However, there are no consequences for students who perform poorly on this instrument. The institution's leaders would like all students to score above the 50th percentile. No specific changes have been made based upon the test results.

A new version of the Academic Profile is available at www.ets.org.hea . With this new version, NMSU is able to provide students and advisers with undergraduate's individual results.

Initially the Coordinating Board of Higher Education would only fund assessment results from commercially developed tests. Now, CBHE will provide some funding for locally developed approaches. However, CBHE still provides more money to institutions that use commercially developed tests. Institutions receive a certain amount of funding depending upon how well their students perform on these tests. Therefore, in reality, institutions may be more motivated to use such tests since there are higher levels of resources offered for these particular types of instruments.

Writing Assessment

In the general education program, there is a sophisticated example of a common assessment across all writing courses required for undergraduates. Faculty have designed an end-of-core writing assessment that students take at the end of the second required writing course. Students are given a series of short, related readings (often from newspapers or magazines) about a controversial topic and then asked to respond to specific prompts. One example is listed below.

Prompts and Topics[3]

Using and citing evidence from at least two of the readings (you may use more than two), along with your own experience and common knowledge, develop a well organized essay on one of the following topics:

Topic A: What causes "hate crimes" in this country and what should be done to prevent them?

Topic B: Do you agree or disagree that hate crime legislation would be effective?

Remember to write an introductory thesis paragraph, a body of paragraphs with detailed evidence to support your thesis and a conclusion. Cite your sources in MLA style.

The end-of-core writing assessment rubric consists of the following dimensions outlined below.[4]

Score of 5 = Excellent

Organization: Impressive introduction, thesis, conclusion, essay plan, ophisticated transitions.

Development: Substantial evidence, and adapts sources easily to defend thesis.

Language: Skillful attention to sentence structure and style, no grammatical errors that inhibit clarity, few usage, punctuation, or spelling errors.

Documentation: Careful attention to academic conventions for citation and proper use of sources, avoiding all plagiarism.

Score of 3 = Adequate

Organization: Functional thesis and introduction; apparent organization with few transitions; some logic problems.

Development: Sufficient examples and detail to support a thesis that makes a valuable statement; some use of sources, some lack of evidence.

Language: Functional sentence structure; some cliches; some grammatical, mechanical or usage errors.

Documentation: Adequate attention to academic conventions for citation and proper use of sources, avoiding plagiarism.

[3, 4] Material copied with permission of David Oehler, Northwest Missouri State University.

Score of 1 = Inadequate

Organization: None, or missing connections between thesis and paragraphs; severe logic problems.

Development: Few, if any details; use only one or no sources; thesis based on generalizations or prejudice; undue reliance on stacked quotes.

Language: Incoherent sentence structure and word choice, frequent grammatical, mechanical, usage errors.

Documentation: Lack of attention to academic conventions for citation and proper use of sources, perhaps committing plagiarism.

Students receive information about the specific criteria that is usually outlined in the course syllabus. In addition, each course syllabus in the writing course sequence also articulates and reinforces the same competencies. These competencies include:

- The practice of effective writing methods;
- The integration of reading and writing methods productively;
- The application of appropriate rhetorical and communication strategies in their writings;
- The development and organization of thorough writings centered in valuable ideas;
- The generation of documented academic essays that display a fully literate style and correct usage; and
- The possession of the knowledge, skills, and attitudes of competent collegiate writers.

These writing competencies and course sequence are designed to fulfill the communication and critical/creative thinking Key Quality Indicators of the university's curriculum.

Undergraduates who receive an inadequate score on the end-of-core assessment must take the assessment again. If the second assessment also is inadequate, then the students have two options:

1. Put together a portfolio before the end of the semester. If both the second assessment and the portfolio are inadequate, then the student must retake the English two-course sequence again.
2. Take a delayed grade if the second assessment also receives the inadequate score. During the next semester, the student must retake the end-of-core assessment a third time. A student may put together a portfolio by the end of that semester if the third assessment is also inadequate. If both the assessment and portfolio receive an inadequate, then the student will need to repeat the English two-course sequence. The portfolio must include a letter introducing the contents, a research paper from one of the composition courses (including both a revised and graded copy), and an essay of the student's choice (including both a revised and graded copy).

The writing assessments and the portfolios are read and assessed by two members of the English Department with a third reader if the initial two readers are not in agreement. Faculty members are trained in how to assess student writing. Faculty initially reviewed a sample of student work to determine how close their individual ratings are to each other's scores. If there are wide discrepancies, they discuss their reasons for scoring student writing in a certain way. Once a fairly high level of consistency is reached, two faculty members read each end-of-core writing assessment. If there are major disagreements between the two readers, then a third reader scores the essay, which brings closure to the assessment. All faculty readers are paid extra compensation for the time involved in reading these essays.

In 1996, about 90 percent of undergraduates passed the test the first time; more than 99 percent passed after completing the test sequence. About half of the failures were typically for plagiarism. In spring 1997, 82 percent of students passed the end of core assessment the first time, and 99 percent passed after completing the test sequence.

Writing Assessment Strategies Across Colleges and Universities in Missouri

The Missouri Colloquium on Writing Assessment (MCWA) is a statewide organization that exists to support faculty members (frequently professors of composition and literature) in all 2- and 4-year public and private institutions in Missouri. This group believes that assessments of writing should primarily be used to improve instruction and "empower students to become successful writers" (MCWA, 1999, p. 2). Typically, the Colloquium convenes a statewide meeting once per year where colleagues review and discuss current issues in writing assessments. The group also surveys faculty about writing instruction and assessment trends and publishes a newsletter for their members.

In the fall 1999 Colloquium, faculty reported some major assessment challenges. One institution reported that "results were purposefully not reported locally because the assessment instrument was externally imposed and not matched to local instructional objectives" (MCWA, 1999, p. 3). Other college faculty had problems with getting their colleagues to conduct writing assessments and cited the following reasons: "(1) they do not want to be assessed because they do not want to be accountable or feel that they are above that kind of accountability; (2) they want to assess, but do not believe that the instruments/data provide meaningful results; (3) they fear that assessment programs are fronts for secret administrative faculty-surveillance agendas; and (4) they are simply weary from the work and expense that assessment (especially large-scale assessment) demands" (MCWA, 1999, p. 3).

Beginning in 1989, the MCWA has conducted a yearly writing survey at all institutions within the state (although mostly public institutions respond). Highlights of the results from the 1999–2000 do not indicate the specific competencies that students should master. The results indicate how students are assessed, but do not indicate how well students perform or how the results are used to make changes or improvements. However, the findings illustrate that "Missouri institutions are at the forefront in the movement to use multiple measures—portfolios, questionnaires, writing conferences, impromptu essays, essays that allow drafting time to judge the success of students and writing programs" (MCWA, 1999, p. 7). Sixteen colleges and universities implement programmatic writing assessments rather than depending upon only nationally normed tests to assess the writing competencies of undergraduates. Twelve of the 27 institutions have a director or coordinator of writing assessment. Faculty in these leadership roles typically have teaching load reductions ranging from 3 hours to 12 hours per year. Readers of students' assessment work normally get paid for their time. The compensation ranges from $10 to $50 per hour, while the average pay is $22.30 per hour. It was beyond the scope of this case study to identify why there are wide ranges in terms of support. However, it is important to note that faculty leaders were

released from courses so that they could focus their energies on the writing assessments. In addition, all readers were given extra compensation for their time.

Documenting Student Achievement

Faculty at Northwest Missouri State University follow a seven-step planning process that applies to general education as well as all major programs. This "process is designed to bring a common, more rigorous planning language to all units of the University and to enhance departmental communication and understanding about programs. Ultimately, it should lead to a University that is more market driven, coherent and efficient in its overall design and operations" (Oehler and Knapp, 1996, p. 1). The seven-step planning process is designed to help university faculty accomplish the following:

- "Define a set(s) of major objectives or key quality indicators, stated in terms of the customers' needs, that serve to focus the team's efforts on a shared set of aims;
- Review and strengthen the design, content and delivery of the teams' curriculum/operations so that they more closely match the needs of their customers and better integrate and coordinate the work of the team members;
- Define a set of outcomes measure that accurately gauge the extent to which the customers' needs are met and that can be used to track progress toward department team, college and university performance improvement goals; and
- With a single process meet many of the external process improvement requirements including the Campus Based Review, Funding for Results, Regional and Specialized Accreditation and the Baldridge Assessment Framework" (Oehler and Knapp, 1996, p. 1).

Currently, the seven-step planning process (as applied to both general education and the academic programs) consists of initially the articulation of the general competency followed by seven more specific goals, and then critical success factors (see attachment B-1 for the Communication Competencies example). The critical success factors are even more descriptive attributes associated with each particular goal. Each goal has at least two critical success factors. Then the deployment strategies are identified. Faculty formally identify the specific courses in the general education program and the majors where students are expected to master the goals and critical success factors. The individuals or committees assigned primarily responsibility are identified. Then the particular assessment measures are articulated for the goals. The assessment frequency is identified, as is the intended audience for sharing the results and the intended usage. Next a summary of results is described, as well as trends over time (if they are available), and competitive comparisons are cited when possible. This seven-step planning process is followed to document each of the 10 competencies both in general education and the academic majors. It provides a strong map that guides the development, implementation, and assessment of competencies across the undergraduate curriculum.

All faculty are required to use this process for their academic programs and for general education. This process is completed on an annual basis, and the individual unit has a formal conversation with the appropriate dean about its accomplishments, how it needs to change to address new challenges and opportunities, and strategies for continually improving. Once each 5 years, these plans are formally reviewed by the President, Board of Regents, the Faculty Senate Curriculum Committee, the Faculty Senate Assessment Committee, the Graduate Dean (for departments with graduate programs), and the Coordinating Board for Higher Education. This seven-step planning

process is embedded within a larger planning process outlined below. The specific format and points to be addressed include the following:

Section 1: What factors are influencing your unit's current and future outlook?

A. What is your unit's mission?

B. What external and internal factors bear on your unit's outlook for the future?

C. Give the factors above, should your mission change? How?

D. What is your unit's five-year vision? How should this vision change given the factors above and your thinking about the unit's mission?

E. How does this vision enable your unit to contribute better to the University's achievement of its mission?

Section 2: What is the current status of your unit?

A. Provide your unit's Seven-Step Plan.

B. What is your analysis and interpretation of the Seven-Step Planning Process results?

C. With regard to performance targets set jointly with University leadership as part of your unit's Seven-Step Planning?

D. With regard to workload objectives established for your unit?

E. What is your unit's strategy for developing its faculty and staff and what resources has it invested in the strategy's achievement this year?

F. What are the key accomplishments of your faculty, staff, and students this year?

Section 3: What future directions have you set for your unit?

A. What are your performance targets, jointly established with University leaders, for the coming year? For the next five years?

B. What is your action plan for achieving these targets, and what resources will be needed?

C. How do these targets contribute to the achievement of University-wide Strategic Initiatives and directions?

Students are the main customers (including those who have completed programs and those currently enrolled). Stakeholders include employers, professional schools, graduate schools, and other organizations that may benefit from Northwest Missouri State University alumni.

One major future initiative at NMSU will be the development of an electronic portfolio. The vision is that all assessment results for individual students, including assessments of their out-of-class activities, will be posted electronically.

Data Ramifications

Faculty use the Academic Profile to assess the general education competencies of their undergraduates. Since the test is commercially developed by the Educational Testing Service and used for many years by different colleges and universities, there is strong record of reliability and validity. The greatest challenge is how to use the results to make improvements at individual institutions. Currently, NMSU staff and faculty mainly review the aggregate scores of their entire group of students and do not know how subgroups of students are performing. They review the aggregate scores to determine if there are improvements or changes over time. Scores have been fairly steady, with an increase from 1998 to 1999. The assessment director is exploring dividing the data into subgroups by academic departments, but this is a relatively new idea so there are no results about its usefulness.

The locally developed end-of-core writing assessment has an increased reliability since all readers are formally trained about how to evaluate student work. Through this formal process, faculty better understand the scoring criteria and reach higher levels of consistency in their judgments about student work. Faculty also believe that a major strength of this assessment is that students must address a real-world issue or problem. Validity is somewhat enhanced since students must read about a particular issue from multiple sources of articles rather than relying only on one document.

In the future, some faculty expect that NMSU will use more locally developed assessment methods since these instruments are more closely aligned with the professors' expectations for student learning. As the university moves in this direction, faculty realize that they will need time to pilot instruments and assistance to determine the reliability and validity of these methods.

Advantages and Challenges Associated With a Competency-Based Educational System

Faculty emphasized that the development of a competency-based model is a very complex process that requires a major commitment of time. Some faculty believed that at least 1 year is needed when beginning to get teams of individuals together and dialoguing so that they feel real ownership of the outcomes. A comprehensive plan is needed rather than a piecemeal approach. Professors believed that they had a good history of support for faculty development from NMSU in terms of release time for their work and summer stipends.

The greatest challenge according to the faculty is the amount of time and energy required for the documentation (Seven-Step Planning Process). Such a formal process requires high levels of support, especially from department chairs, to conceptualize, review, and implement their plans. Another level of complexity is added by the specific requirements mandated by the Missouri Higher Education Coordinating Board. Faculty must insure that the general education program adheres to the policies of CBHE. However, the planning process is very useful since it helps faculty to think about the needs of their own students and the larger needs of the entire state.

Recommendations for Other Colleges and Universities

Faculty stressed the importance of providing release time during the semester so that instructors can seriously work on their course and program revisions. Stipends are critical in the summer for faculty since they typically have a bit more time to reflect upon their designs and curriculum changes. Faculty development is also crucial since professors often need some formal time to work with colleagues and learn about new ideas.

At NMSU, faculty usually have two full professional development days at the beginning of a semester before classes begin. They reported that these days were very important to their successful plans and implementation.

Faculty also emphasized that it is important for senior administrators and academic leaders to build a culture open to change. This culture is also focused on the improvement of education and the establishment of regular feedback mechanisms to better meet the needs of their customers—the students.

Conclusion

The senior leadership at Northwest Missouri State University have succeeded in building and sustaining an institutional culture of quality. The use of key quality indicators helps the university to link broader goals for general education with competencies across different majors. Since the same quality indicators apply across programs and general education, there is also greater coherence among the learning experiences for undergraduate students. In addition, students have opportunities to build upon their skills and refine them through multiple courses across the curriculum. A major strength of this approach is the fact that the assessment plans are fully embedded in a larger strategic planning process required of all units and programs.

Faculty have shifted their primary emphasis from an instruction model (based on what faculty want to teach) to a more learner-centered approach. Through multiple methods, faculty determine specifically what undergraduates need to be successful in the real world and then build learning experiences to address those needs. Finally, faculty formally assess student learning to determine if students are mastering the important outcomes.

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Attachment B-1
Northwest Missouri State University[5]

GENERAL EDUCATION: CORE AND LIBERAL STUDIES
Seven-Step Process Matrix
09/24/97

Steps 1 and 2	STEP 3			
Instructional KQ1 and Validation	**Goal**	**Critical Success Factor**	**Deployment Strategy**	**Primary Responsibility**
1. Communication Competencies	1A. Generate researched writings that develop and organize a valuable central idea	1Aa. Summarize, analyze and synthesize research sources	English Composition (10-110,111,112, 115)	Dean, College of Arts and Sciences General Education Advisory Group (GEDAG)
		1Ab. Incorporate research coherently into writing organized around a central idea		
		1Ac. Use an academic citation method accurately and astutely		
	1B. Use writing processes successfully to invent, plan, draft, revise, and edit	1Ba. Applying writing and learning processes effectively to produce impressive ideas		
		1Bb. Revise, polish, and edit papers well		
	1C. Comprehend presentational and interpersonal messages	1Ca. Identify the main point of a speech	Oral Communication (29-102)	
		1Cb. Recall significant facts		
	1D. Use critical and empathetic listening	1Da. Recognize unsupported arguments		
		1Db. Recognize fallacies		
	1E. Prepare and perform informative and persuasive speeches	1Ea. Use, select, research, and organize ideas		
		1Eb. Deliver effective informative and persuasive speeches		
	1F. Understand and appreciate literature and its study	1Fa. Read and understand literary works	Literature (10-220)	
		1Fb. Understand the nature of literary works and their genres		
	1G. Apply basic literary methods in readings, discussions, and writings	1Ga. Describe works of literature in basic terms like genre and point of view		
		1Gb. Analyze literature using basic methods of literacy criticism		

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GENERAL EDUCATION: CORE AND LIBERAL STUDIES
Seven-Step Process Matrix (Continued)

Step 4				Step 5		
Measure/Indicator	**Assessment Frequency**	**Intended Audience**	**Intended Usage**	**Results/Baseline**	**Trends**	**Competitive Comparisons**
Locally developed end-of-core assessment	Once, at end of sequence	English faculty and composition committee; GEDAG	Barrier exam for student; General Education Program Assessment	Spring 96: About 90% of students pass the test on the first taking; more than 99% pass after the test sequence is over; 50% of failures are typically for plagiarism Spring 97: 82% of students passed the end of core test on first taking, 99% overall	In the most recent test, failure rates overall were higher but failure for plagiarism was down to less than 10% of all failures Plagiarism failure at 3.06% (lowest ever)	None available; no comparable test given at end of first year sequence at any local or comparable school None available
ACT Assessment	Pilot: once during last course in sequence	Composition committee; GEDAG	General Education Program Assessment	Not yet available from ACT	None available	None available
Exercises, quizzes, tests, papers, portfolios, class participation, peer response, conferences, electronic media exchanges, etc., converted to grades	Constantly during courses	English faculty and students	Assessing student ability and measuring student knowledge about language and writing	Implementing fall 1997	None available	None available

GENERAL EDUCATION: CORE AND LIBERAL STUDIES
Seven-Step Process Matrix (Continued)

Step 4				Step 5		
Measure/Indicator	**Assessment Frequency**	**Intended Audience**	**Intended Usage**	**Results/Baseline**	**Trends**	**Competitive Comparisons**
Academic Profile: Writing subscore	All rising seniors	English faculty and students	Assessing student ability and measuring student knowledge about language and writing	Northwest students average 116. Baseline established 5 points: fall 1994-fall 1996	Stable	Equal National Average
Nationally standardized listening test In-class testing	Once each semester 17 (one each chapter)	Speech 102 instructors; General Education Program Assessment; GEDAG	Monitor and improve teaching skills Measure student listening	Track mean scores on all assessments	None available	None available; seeking other schools that use standardized listening test

GENERAL EDUCATION: CORE AND LIBERAL STUDIES
Seven-Step Process Matrix (continued)

Step 4				Step 5		
Measure/Indicator	**Assessment Frequency**	**Intended Audience**	**Intended Usage**	**Results/Baseline**	**Trends**	**Competitive Comparisons**
Midterm exam	Once each semester	Program Assessment; GEDAG	Measure student knowledge of listening		None available	None available
Peer critiques of speeches	Three per semester		Measure student knowledge of listening			
Nationally standardized listening test	Once per semester		Monitoring and improve teaching of listening skills	Track mean score on standardized listening test	None available	None available; seeking other schools that use standardized listening test
Final test			Measure student knowledge of listening			
Midterm exam						
Peer critiques of speeches	Three per semester	Speech 102 instructors; GEDAG	Measure student knowledge of listening	None available	None available	None available
Locally developed common critique sheet	Once each semester		Monitor and improve student speaking	Track mean organization score on informative speech assignments	None available	None available

GENERAL EDUCATION: CORE AND LIBERAL STUDIES
Seven-Step Process Matrix (continued)

Step 4				Step 5		
Measure/Indicator	**Assessment Frequency**	**Intended Audience**	**Intended Usage**	**Results/Baseline**	**Trends**	**Competitive Comparisons**
Final Exam Questions (locally developed)	Once each semester	Speech 102 instructors; GEDAG	Monitor and improve student speaking	Measure student knowledge about language	None available	None available
Nationally standardized McCroskey's PRCA	Twice per semester		Monitor and improve student confidence in speaking	Compute mean PRCA score	None available	Compare to national average

GENERAL EDUCATION: CORE AND LIBERAL STUDIES
Seven-Step Process Matrix (continued)

Step 4				Step 5		
Measure/Indicator	**Assessment Frequency**	**Intended Audience**	**Intended Usage**	**Results/Baseline**	**Trends**	**Competitive Comparisons**
Exercises, quizzes, tests, papers, portfolios, class participation, peer response, conferences, electronic media exchanges, etc., converted to grades	Constantly during courses	Individual teachers and students	Assessing student ability and measuring student knowledge about language and literature	Students who have succeeded in this course do much better at reading, writing and speaking, since they understand irony, point of view, voice and close analysis of language	None available	None available
AP: Reading subscores	All rising seniors			Northwest students average 120 Baseline established 5 points fall 1994-fall 1996	Decline	Equal National Norm
Exercises, quizzes, tests, papers, portfolios, class participation, peer response, conferences, electronic media exchanges, etc., converted to grades	Constantly during courses			Students who have succeeded in this course do much better at reading, writing an speaking, since they understand irony, point of view, voice and close analysis of language	None available	None available
AP: Reading subscores	All rising seniors			Northwest students average 120. Baseline established 5 points fall 1994-fall 1996	Decline	Equal National Norm

GENERAL EDUCATION: CORE AND LIBERAL STUDIES
Seven-Step Process Matrix (continued)

Step 6 Benchmarking	Step 7 Performance Target/Stretch Goals
	Virtually no failures of the end-of-core assessment for plagiarism Better usage with no deficit in other abilities
	Strongly internalized understanding among students to the advantages of good writing processes Significant reduction in student procrastination in the face of writing assignments
	None yet
	Exceed National Average scores on PRCA by ½% per year

Notes: AOS: Alumni Outcomes Survey; sample of Northwest alumni 3 years after graduation.
COS: College Outcomes survey; 50 percent of the first semester sophomore class.
CSEQ: College Students' Experience Questionnaire; 50 percent of the first semester sophomore class.

APPENDIX C

Sinclair Community College

Introduction

The purpose of this case study was to explore the competency-based educational system at Sinclair Community College with a particular focus on the development of competencies and how they are assessed.

In the fall 1999 semester, four faculty who worked at Sinclair Community College were interviewed by the Working Group consultant. Each individual interview lasted between 40 to 50 minutes. Participants were full-time faculty representing different ranks (full, associate, and assistant professors). Documents reviewed by the consultant, including the college catalogue and selected reports about Sinclair Community College, described their assessment plans and results.

The Setting

Sinclair Community College is a comprehensive 2-year community college offering a diverse range of about 1,500 university-parallel, technical, and career courses to a student body of approximately 18,000 students. Sinclair is the largest single-campus community college in Ohio and one of the 20 largest in the United States. It is accredited by the North Central Association of Colleges and Schools and is located in an urban inner city.

Sinclair Community College has six degree-granting academic divisions, including Allied Health, Business Technologies, Engineering and Industrial Technologies, Extended Learning and Human Services, Fine and Performing Arts, and Liberal Arts and Sciences. It is an open-door institution and admits all applicants into the college.

Identifying Important Outcomes

In the mid-1980s, Sinclair Community College administrators and faculty began contemplating the possibility of guaranteeing the entry-level skills of their graduates. However, they realized that before they could make such a guarantee, they had to clearly articulate student learning outcomes and determine if they were meeting employers' needs. That was the first step toward defining competencies and developing an assessment plan at Sinclair. Faculty and administrators formally examined their program outcomes and identified both formative and summative assessment needs. In 1992, Sinclair decided to ultimately adopt the guarantee of entry-level skills for their graduates. If graduates were not prepared for their entry-level jobs in certain areas, they could take up to nine credits of additional coursework at no additional charge. However, employers must certify in writing the specific job skills that need to be strengthened. This guarantee only applied to graduates employed on a full-time basis directly related to the area of program concentration as certified by the Vice-President for Instruction (Sinclair Community College, 1999). A similar guarantee was in place for students who transferred to another institution.

Some faculty believed that there was an important need to identify and assess student outcomes since there were external requirements from the accreditation mandates by the North Central Association of Colleges and Schools. However, there was no formal state mandate in Ohio to implement assessment.

Another reason for the focus on competencies and their assessment was that Sinclair embraced the principles of the "learning college" and wanted to move toward more active or collaborative experiences for their students. The learning college is based on six key principles (O'Banion, 1999, p. 5) and seeks to:

- Create substantive change in individual learners;
- Engage learners in the learning process as full partners who must assume primary responsibility for their own choices;
- Create and offer as many options for learning as possible;
- Assist learners to form and participate in collaborative learning activities;
- Define the roles of learning facilitators in response to the needs of learners; and
- Document improved and expanded learning of students.

Many institutions have provided data about institutional effectiveness such as rates of graduation, persistence, or employment for selected alumni. These types of data are very important to share, especially with external stakeholders. However, the learning college concept as proposed by Terry O'Banion (1995) places an emphasis on the widespread engagement of faculty and staff in key discussions about the specific definitions of learning. Such discussions and decisions about what specific competencies comprise learning are important to examine as faculty consider the design of learning experiences. Faculty at Sinclair Community College believed that these types of substantial changes would lead to better retention of material across courses and higher levels of learning for their undergraduate students.

At Sinclair, general education was defined as "supporting individuals in the quest to become whole, complete persons by encouraging the development in areas such as thought, communication, values, creativity feeling, adaptability and awareness" (Sinclair Community College, 1999, p. 54). The specific outcomes for general education are outlined in Table 1. Faculty identified which particular courses were designed to fulfill the competencies.

"This general education program was designed to provide foundation skills necessary for successful living in the ever-changing present and future global environment" (Sinclair Community College, 1999, p. 54). General education was also structured to provide a sense of community and foster collaborations. Students must complete 20 quarter hours of courses in communication, English, social science, humanities, mathematics, and computer literacy. This curriculum was primarily a set of distribution requirements where students had choices about which particular courses they should take. In addition to gaining educational breath, these courses supported the development of three major "across-the-curriculum" competencies, including communication, thinking, and values/citizenship/ community.

Each academic program faculty group defined learning outcomes that indicated expectations for student achievement in their particular majors. In effect, these competencies served to define the specific knowledge and technical skills that college students should be able to demonstrate. The outcomes for each program are published in *Continuous Improvement Through the Assessment of Student Learning Outcomes: A Work in Progress* (Sinclair Community College, 1998). Faculty identified the specific courses that are targeted for preparing students to achieve each particular competency in the program. They usually also articulated the specific outcomes related to general education that are built upon in major courses.

Table 1.—Learning outcomes for general education

Learning Outcomes	Related Courses
1. Communicate the significance of facts, ideas in spoken and written English that is clear, precise, and logical.	All English and Communication concepts, and courses
2. Demonstrate a problem-solving capability through analysis and synthesis.	All Math courses and all Science courses; Philosophy 207
3. Recognize ways in which a scientific approach can be used to formulate an understanding of the observable world.	All Science and Social Science courses
4. Recognize and describe interactions and institutions that characterize the the individual and society.	All Social Science courses
5. Appraise the values and character of both Western and non-Western cultures.	Arts, History, Philosophy, Humanities, Foreign Language, and Social Science courses
6. Recognize and appraise various forms in which human creative efforts are expressed.	Literature, Art, Music, Dance, and Theatre courses
7. Demonstrate academic proficiency comparable to students completing the second year of a baccalaureate degree program.	All courses

Assessment Strategies

As a result of the open-door admissions policy at Sinclair, the abilities of entering groups of students varied substantially. Therefore, the college measured the entry-level competencies of students through COMPASS (Computer Adaptive Placement Testing), an assessment developed by the American College Testing company to ensure reliability and validity. COMPASS is a battery of assessment instruments designed specifically for use by community, technical, and junior colleges. The instruments assess reading skills, language usage, numerical skills, elementary algebra, intermediate algebra, and college algebra. Some programs used additional instruments for diagnostic and/or placement purposes. For example, the English department mandated that all students complete a writing sample on the first day of class to verify their placement based on COMPASS results.

It is frequently challenging to make decisions about assessments of general education. Sinclair initially focused on writing and communication. The specific competencies for writing skills are outlined in a checklist form (see attachment C-1). Some professors shared this list with their students and instructed them that it would be the basis for evaluating writing assignments. The checklist consisted of five major categories (with specific competencies defining each category), including assignment profile, content, organization, style, and mechanics. The rating scale indicated an evaluation of mastery of each writing skill by indicating an absolute yes or no or not applicable. A second oral communication checklist (see attachment C-1) was developed. Faculty followed a DACUM (Developing a Curriculum) process to identify important communication skills that faculty members and students thought were important. DACUM typically includes a panel of appropriate experts to identify general areas of competence and then specific competencies for each particular area. Through the DACUM process at Sinclair, participants categorized the important speech communication skills into the areas of public speaking, small group communication, interpersonal communication, and listening. Each particular communication skill area was then further defined by a range of 7 to 13 specific competency statements. The rating scale for the speech communications checklist consisted of a five-point range from totally absent to excellent. There were some early adopters, but the majority of faculty were not using it yet.

These forms were used by faculty to evaluate student mastery of specific skills. Students themselves or their peers may also assess each other. The vision was that eventually these checklists would be used in the majority of courses since these skills were supposed to be developed in all disciplines. Additional checklists were being developed to define competencies in values/citizenship/community and in thinking.

The Cornell Critical Thinking Test was piloted recently for students taking general education courses in sociology and psychology. Another pilot will be conducted for graduates of the Liberal Arts and Science degree programs. No formal decision was made to adopt this particular tool to assess general education outcomes. Other alternatives that were being considered included using portfolios or developing a freshman year experience introductory course where assessments could occur and be compared with results from a new capstone course at the end of the program.

Each academic department at Sinclair developed or refined multiple methods to assess students' achievement in specific learning outcomes within their major. Final development of each assessment plan was completed in June 1993. These plans were open to revisions or refinements over time. Academic program faculty used a variety of assessment methods, including commercially available and standardized national exams, comprehensive examinations and final projects evaluated by peers, faculty, and/or external evaluators, comprehensive research paper or thesis, programmatic growth contracts, observations or simulated work experiences, proficiency checklists for writing and speaking, and evaluations of student performances and achievement of skills by faculty members and/or external evaluators.

Some faculty believed that the reliability and validity of these assessment tools were increased since they were developed by working with numerous professors, external consultants, advisory boards, and the Institutional Planning and Research Office.

A recent initiative (currently embedded within a small number of individual courses) underway at Sinclair was a movement labeled "process learning." Since Sinclair instructors wanted to fully embrace the learning college concept, some faculty were adopting learning-centered experiences for their students. The underlying philosophy for this approach was that faculty believed they could develop stronger student learners who would know how to continuously improve their own learning processes. The instructor's role changed from being the authority figure to facilitating student-centered

learning experiences. This was an important educational development because the participating faculty were essentially defining specific competencies for individual courses in the following areas: applied critical thinking, problem-based learning, cooperative teams, and communications. Faculty used different assessment methods to accompany their new teaching approaches. Examples of assessment methods included journal writing, case studies, role plays, guided discoveries, and project work. These formative assessments may be done by faculty, student peers, or the individual student. Portfolios were also being used by some faculty.

Documenting Student Achievement

Faculty were required to share their progress and assessment results on a regular basis. This information was gathered through a set of interviews that were done with each academic department every 2 years. Trained faculty members conducted the interviews and asked faculty to respond to six specific areas:

- Learning outcomes;
- Curriculum information;
- Assessment methods;
- Assessment results;
- Analysis and actions taken; and
- General education linkages.

The learning outcomes were a series of specific competencies that students were expected to master. In addition, the general education linkages also focused on liberal learning competencies such as communications or critical thinking. Most program faculty used multiple methods to assess these outcomes, and they were frequently embedded into required courses. Program faculty articulated their assessment results. The majority of assessment results revealed that faculty were "on target" and that no changes or improvements were necessary. Students reported that the writing and speech checklists were very helpful, but it was not clear how they may strengthen these particular outcomes.

Sinclair decided to use interviews rather than surveys as the main vehicle to collect assessment information. They found that the results were more useful and the process made the reporting less burdensome for the faculty. The interviewers wrote the reports and then asked the individual departments to review them for accuracy and to insure the validity of the content. The college was getting higher quality information as a result of this interview process used to document student learning outcomes.

An assessment steering committee oversaw the assessment plans and results. This committee worked with the leadership of a coordinator for assessment who reports to the vice president for instruction.

Data Ramifications

Faculty primarily assessed student outcomes by using locally developed approaches. They worked with experts on campus and with consultants. They thought that such a process would make the methods more reliable and valid. The assessment checklists for writing and oral communications were used by some faculty. However, since faculty of each program were using different assessment

methods that changed over time, it was difficult to determine the actual reliability and validity of the instruments.

The COMPASS instrument was used to assess the abilities of entering groups of undergraduates. This type of assessment could be examined for its reliability and validity since it was used systematically each year. In addition, the American College Testing company could also provide information about the usefulness of this placement test, and comparisons could be made across institutions if desired. These placement tests could be re-administered a second time (after students complete a series of college courses) to better understand if students were gaining in their abilities. Such longitudinal assessments were not yet evident systemwide at Sinclair Community College.

Advantages and Challenges Associated with a Competency-Based Educational System

A major strength of the Sinclair competency-based educational system and its assessment was that faculty felt strong ownership for its development and implementation. Getting faculty responsible for the leadership in the university-wide assessment committee really helped professors to have a strong commitment to making it succeed. Faculty ownership also led to higher motivation. These changes were constructed with the assumption that formative assessment plans work best since they can lead to internal improvements that faculty more highly value.

When faculty initially developed and implemented comprehensive assessment plans, it took a considerable amount of resources and time. In the early assessment plan, Sinclair's leaders tried to do everything at one time. As these new ideas were introduced, the leadership realized that they were moving too quickly. Therefore, they examined their current environment and identified the top priorities and how those could be measured. The assessment of general education outcomes was a good example of certain priorities being identified by the leadership, and an incremental plan was developed to implement these initiatives over several years rather than in a single year.

Another related challenge was how to account for the change in faculty time. With these new assessment developments, faculty spent considerable time revising their course and program plans. Sinclair faculty were successful in receiving substantial merit pay based primarily upon the documentation of their assessment activities. In addition, a new performance review system was being piloted where faculty could choose to have assessment as a major category to demonstrate their success when they are reviewed by their peers.

Recommendations for Other Colleges and Universities

Faculty believed that there were several important ingredients to create a competency-based educational system with accompanying assessments. They asserted that with these critical elements in place, colleagues at other institutions could adopt a similar process to develop these types of initiatives.

Adequate resources for training and development were critical. Faculty frequently attended seminars to learn how to write competency statements and to consider a range of new assessment methods. Faculty reported that these types of seminars were very important to help them successfully implement their new ideas. In addition, release time from courses for faculty to substantially revise their curriculum was extremely important. Support from central administration at the senior levels was important too.

Faculty also emphasized the importance of pilot testing new ideas with time and opportunities to make revisions. As faculty discovered techniques that work well, they may continue using them. However, if certain techniques do not work, then they can make changes based upon the assessment results.

Conclusion

The faculty at Sinclair Community College worked consistently for nearly a decade to build and implement comprehensive assessment plans. Training and development was essential for faculty to learn how to clearly articulate the specific competencies that college students should achieve. All major program faculty also identified the specific general education competencies (critical thinking and communications) that students should gain through study in the areas of specialization. This was a major strength of their plan and created continuity or coherence within the total curriculum. Students knew as beginning freshmen that the faculty in their major programs would have clear expectations for their learning that built upon the liberal learning skills gained in the general education curriculum.

Some Sinclair faculty shifted their emphasis from instruction and teaching to a focus on producing learning. They were experimenting with new assessment methods, particularly tools that are embedded within specific courses. To date, there was no systematic information about the reliability and validity of the assessment tools. However, as faculty continue their pilot tests and eventually adopt certain assessment methods over time, a clearer picture about the specific impact of the competency-based curriculum on student learning and development will most likely emerge.

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Attachment C-1

SINCLAIR COMMUNITY COLLEGE
GENERAL EDUCATION WRITING SKILLS CHECKLIST[1]

ASSIGNMENT PROFILE	YES	NO	N/A
1. Understand the type of writing required			
2. Determine the purpose of the writing task			
3. Understand the requirements of the writing task			

CONTENT	YES	NO	N/A
1. Clear main idea			
2. Stimulating, insightful main idea			
3. Accurate support			
4. Adequate support			
5. In-depth, authoritative support			
6. Critical, analytical, and/or creative support			

ORGANIZATION	YES	NO	N/A
1. Clear opening/introductory section			
2. Engaging, stimulating opening			
3. Consistent, well-planned method of organization			
4. Creative, unique method of organization			
5. Transitional sentences and/or paragraphs			
6. Clear closing/concluding section			
7. Engaging, convincing closing			

STYLE	YES	NO	N/A
1. Appropriate vocabulary for audience/reader			
2. Effective word choice, diction			
3. Varied sentence structure			
4. Well-crafted, balanced sentences (parallelism)			
5. Effective transitional words and phrases			

[1] Material copied with permission of Karen Wells, Sinclair Community College.

SINCLAIR COMMUNITY COLLEGE
GENERAL EDUCATION WRITING SKILLS CHECKLIST (continued)

MECHANICS	YES	NO	N/A
1. Accurate Spelling			
2. Correct Capitalization			
3. Correct Usage			
A. Verb Tense	A.	A.	A.
B. Verb Agreement	B.	B.	B.
C. Pronoun Reference	C.	C.	C.
D. Adjective/Adverb Use	D.	D.	D.
E. Sound-Alikes	E.	E.	E.
4. Correct Punctuation			
A. End Marks	A.	A.	A.
B. Semicolons/Colons	B.	B.	B.
C. Quotation Marks	C.	C.	C.
D. Commas	D.	D.	D.
E. Apostrophes	E.	E.	E.
F. Dash, Hyphen, Parentheses	F.	F.	F.
G. No Run-on Sentences	G.	G.	G.
H. No Unintentional Fragments	H.	H.	H.
5. Formal			
A. Presentation/Neatness	A.	B.	C.
B. Documentation	A.	B.	C.

SINCLAIR COMMUNITY COLLEGE
ORAL COMMUNICATION CHECKLIST[2]

PUBLIC SPEAKING SKILLS	ABSENT	POOR	NEEDS IMPROVEMENT	FAIR	GOOD	EXCELLENT
Preparation						
1. Determine the purpose of oral discourse	0	1	2	3	4	5
2. Choose a topic and adapt it according to the purpose and the audience	0	1	2	3	4	5
3. Fulfill the purpose of oral discourse by:						
A. formulating a thesis statement	0	1	2	3	4	5
B. providing adequate support material and documentation	0	1	2	3	4	5
C. selecting a suitable organizational pattern (sequence)	0	1	2	3	4	5
D. demonstrating careful choice of words	0	1	2	3	4	5
E. providing effective transitions	0	1	2	3	4	5
F. providing internal summarization	0	1	2	3	4	5
4. Establish source credibility	0	1	2	3	4	5
Presentation						
5. Employ vocal variety in rate, pitch and intensity	0	1	2	3	4	5
6. Articulate clearly	0	1	2	3	4	5
7. Employ the level of language appropriate to the designated audience	0	1	2	3	4	5
8. Demonstrate nonverbal behavior that supports the verbal message	0	1	2	3	4	5
9. Use of appropriate speaking aids (visual, auditory)	0	1	2	3	4	5
SMALL GROUP COMMUNICATION SKILLS						
1 Demonstrate understanding of facilitator role	0	1	2	3	4	5
2. Facilitate a group meeting	0	1	2	3	4	5
3. Ask appropriate questions	0	1	2	3	4	5
4. Encourage balanced participation	0	1	2	3	4	5
5. Demonstrate effective use of agendas	0	1	2	3	4	5
6. Demonstrate effective collaboration	0	1	2	3	4	5
7. Utilize idea generation techniques	0	1	2	3	4	5
8. Utilize appropriate decision making processes	0	1	2	3	4	5
9. Manage conflict effectively	0	1	2	3	4	5
10. Recognize nonverbal factors unique to teams	0	1	2	3	4	5
11. Recognize stages and outcomes of stages in teams	0	1	2	3	4	5
12. Demonstrate effective informal and formal team roles	0	1	2	3	4	5
13. Differentiate between task and relationship behaviors	0	1	2	3	4	5

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INTERPERSONAL COMMUNICATION SKILLS	ABSENT	POOR	NEEDS IMPROVEMENT	FAIR	GOOD	EXCELLENT
1. Phrase questions in order to obtain information	0	1	2	3	4	5
2. Demonstrate understanding of and ability to contribute to a climate which is open, descriptive, supportive	0	1	2	3	4	5
3. Verbalize feelings in appropriate situations for disclosure	0	1	2	3	4	5
4. Describe opposing points of view	0	1	2	3	4	5
5. Paraphrase information given by others	0	1	2	3	4	5
6. Effectively manage conflicts with others	0	1	2	3	4	5
7. Strive for consensus	0	1	2	3	4	5
LISTENING SKILLS						
Attending						
1. Recall basic ideas and details	0	1	2	3	4	5
2. Recognize main ideas	0	1	2	3	4	5
3. Identify supporting details	0	1	2	3	4	5
4. Recognize explicit relationships among ideas	0	1	2	3	4	5
5. Listen attentively	0	1	2	3	4	5
Understanding						
6. Discriminate between statements of fact and statements of opinion	0	1	2	3	4	5
7. Distinguish between emotional and logical arguments	0	1	2	3	4	5
8. Detect bias and prejudice present in an interaction	0	1	2	3	4	5
9. Recognize the speaker's frame of reference	0	1	2	3	4	5
Evaluating						
10. Synthesize and evaluate by drawing logical inferences and conclusions	0	1	2	3	4	5
11. Recall implications and arguments	0	1	2	3	4	5
12. Recognize discrepancies between the speaker's verbal and nonverbal messages	0	1	2	3	4	

APPENDIX D

Hagerstown Community College

Introduction

The purpose of this case study was to explore the career transcript system implemented at Hagerstown Community College. This new career transcript built upon earlier work focused on the creation of CD-ROM modules designed to address specific competencies that college students should master. The overarching purpose of this initiative was to help college faculty and administrators prepare productive technicians. A consortium of organizations collaborated on these initiatives with support from the National Science Foundation (NSF). Although work on the career transcript was in beginning stages of development and pilot testing, this particular initiative was selected to study since it may significantly influence competency-based initiatives at other institutions.

In the fall 1999 semester, five faculty at Hagerstown Community College were interviewed by the Working Group consultant. Each individual interview during the site visit ranged from 30 to 60 minutes. Participants were full-time faculty who were directly involved and provided leadership in the development and implementation of the competency-based educational experiences at Hagerstown Community College. In addition, the co-principal investigator of this work was also interviewed. Numerous documents, including the college catalogue, published chapters, and evaluation reports, were reviewed by the Working Group consultant.

The Setting

The workplace is changing dramatically. Employees are less supervised and more often expected to make decisions that were formerly made by their managers (Carnevale, Gainer, and Meltzer, 1990). Employers want a new type of worker with a broad set of foundation skills at least in the basics that will enhance learning on the job. Today manufacturers seek well-trained employees who can work effectively in teams to solve real-world problems. In 1995, a consortium was formed including the Johns Hopkins University, related industries, a multimedia production company, Hagerstown Community College, Modesto Junior College, New Hampshire Community and Technical College System, Northern Essex Community College, and South Seattle Community College.

The main purposes of this consortium's work (funded for 3 years by the National Science Foundation as the first phase of work) was to determine how to:

- Prepare community college graduates for the 21st century;
- Help students learn competencies that will remain valuable as technology changes and they change jobs and employers;
- Provide students with a degree that is "portable," one that is recognized by employers in different states;
- Encourage faculty from many disciplines in different institutions to use electronic communicate to collaborate on course construction; and
- Use CD-ROMs to integrate workplace competencies into general education coursework (Packer and Mathias, 1995, p. 38).

These purposes guided the development and design of the entire initiative.

Identifying Important Outcomes

One of the early issues in this project was reaching an agreement on the specific educational outcomes that college graduates should master. For about 1 year, a panel of 17 employers met four times with another panel of 15 educators representing the nation's community colleges (Packer and Mathias, 1995). This length of time was necessary in order to promote a full discussion and review of potential important outcomes. In addition, the appropriate and necessary stakeholder groups were directly participating in the identification and consensus-reaching process. The two panels drew upon a number of sources to define standards including research from the Secretary's Commission on Achieving Necessary Skills (SCANS), an existing DACUM (Developing a Curriculum in Manufacturing) report, and the skills-setting efforts of the participating industry representatives (Packer and Mathias, 1995).

These panels suggested two sets of recommendations. First, they recommended that any curriculum should be:

- Able to serve diverse populations, including underemployed older workers;
- Consistent with curricula of both high schools and colleges;
- Integrated with existing academic programs in the current community college system; and
- Able to use technology in delivering instruction (Packer and Mathias, 1995, p. 40).

The second recommendation was that 22 workplace competencies should be taught within 16 different modules. The SCANS competencies included three foundation skills and personal qualities, as well as five workplace skills that are necessary for effective performance on the job:

- Foundation Skills
  - Basic skills: Reading, writing, arithmetic and mathematics, and speaking and listening.
  - Thinking skills: To reason, to think creatively, to make decisions, and to solve problems.
  - Personal qualities: Individual responsibility and self-management, and sociability and integrity.
- Workplace Competencies
  - Resources: How to allocate time, money, materials, space, and staff;
  - Interpersonal skill: Work on teams, teach others, serve customers, negotiate, and work well with people from culturally diverse backgrounds.
  - Information: Acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.

- Systems: Understand social, organizational, and technological systems, monitor and correct performance and design or improve systems.
- Technology: Select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot equipment (SCANS, 1992).

Ultimately, this NSF project focused on covering SCANS competencies through five CD-ROM modules assigned to a particular academic home.

Creating CD-ROM Modules to Address Important Competencies

Five lead college teams (from the participating institutions in the consortium whose disciplines include mathematics, information science, English and technical communication, science, business, and technology) had responsibility for developing, designing, and implementing modules with guidance from John Hopkins University. The multidisciplinary nature of each working group strengthened cross-disciplinary learning within each module (Packer and Mathias, 1995). Some teams substantially designed and programmed modules, while other teams primarily served in an advisory review capacity for ideas generated and designed by John Hopkins University. Most faculty helped design the modules to include course content.

The five CD-ROM modules included (1) Designing the Electric Car: Selecting from Alternatives to Maximize Profit; (2) Improving the Quality: Putting Together a Problem Solving Team; (3) Making Complex Decisions: Using Computer Modeling and Decision Matrices; (4) Using Statistical Quality Control: Monitoring and Correcting Performance to "Build Quality In"; and (5) Using a Problem Solving Process to Improve and Design a System: Making an Engineering Change Orders Paperless.

Each module was embedded into the appropriate existing course. One module was designed for mathematics, one for science, two for technology (engineering and computer), and one for a communication course. The CD-ROMs and accompanying materials for each module constituted about 9 hours of a particular course or 20 percent of a three-credit semester course. Each module was designed by faculty to teach some of the course content in math, science, or communications. Also, each particular module was created to teach certain skills outlined in the SCANS competencies or standards associated with the module.

For each particular module, faculty teams identified one or two primary SCANS skills that were supposed to be addressed. In some cases involving complex problems, additional SCANS skills could be learned by students. Faculty designed real-life scenarios or cases that students solve. These learning experiences focused on authentic problems that frequently occur in industry. The CD-ROM technology offered scenarios that present open-ended problems where students must typically draw upon knowledge from several disciplines. Instructors agreed upon a particular problem with enough academic content to support the student research and to justify placing the module within a particular discipline and course (Mathias, 1999). Students typically worked in teams to research, organize and present data, write reports, and give presentations justifying why they made certain decisions. The CD-ROMs also contained tutorials for students who wanted to review information about certain pertinent subjects such as statistics or team roles.

Assessment Strategies for Course-Embedded Modules

The SCANS outcomes included process skills that can be more difficult for faculty to assess within the traditional classroom. Instructors frequently construct multiple-choice tests to measure recall or understanding of material. However, certain process skills such as working effectively in a team or making a strong oral presentation require faculty to observe performance and thus make the assessment more authentic. In addition, the cases within each module require students to apply knowledge and solve complex problems.

Faculty worked with AES, International (a commercial company) and the SCANS competencies to develop behavioral indicators that documented performance mastery of certain outcomes. The instructors prepared lists of tasks and the actual behaviors they expected of students completing the projects as outlined in the CD-ROM learning experiences. Then the commercial company translated these behaviors into an assessment scoring rubric. Faculty were taught about how rubrics were constructed and then used as a means of documenting student performance. Faculty with experience over time may then refine these behavioral indicators. In effect, these indicators defined successful student performance. Typically, three of these types of assessments would be completed for students within each particular module.

Attachment D-1 includes an example of an actual student performance assessment method. As students solved an advertising problem (in this particular example), they were expected to demonstrate their command of the subject that composes the top categories on this assessment form. Faculty, students themselves, or their peers can then evaluate their performance by rating the strength of their knowledge with a range of no understanding to expert understanding. The problem-solving skills were defined by the competencies at the bottom of the form. These competencies were identical for all modules addressing problem solving. Typically, there were five to seven competency statements listed. Other modules may address working in teams, interpreting and communicating information, and making a presentation. Again, evaluators rated the degree of mastery. In the future, the criteria listed at the bottom of the form may become a mixture of different SCANS outcomes rather than only one particular outcome, such as problem solving.

Some outcomes are interrelated rather than discrete units. Although faculty teams worked to isolate tasks and align them with certain individual outcomes, it is possible that students may demonstrate their ability to work in teams as well as their ability to work with diversity simultaneously. On one specific task, faculty could then evaluate student performance in working with teams and working with diversity. Faculty teams plan to examine other behavioral indicators for SCANS outcomes and test them by linking outcomes to specific tasks within the learning modules.

A second form of assessment consisting of videos was developed by another commercial company. These assessments were designed to evaluate certain SCANS competencies. Students were presented with a scenario in the workplace that simulates a real problem. Then, through a multiple-choice assessment, students selected the most appropriate answer that was evaluated by the commercial company. Some faculty found these video assessments to be less useful since they did not develop them. Also, some faculty did not believe that the videos related directly to their own objectives for their particular course.

Documenting Student Achievement on the Career Transcript

As this new system incorporating project-based modules was embedded into the curriculum, faculty and employers strongly believed that the traditional transcript with letter grades was not sufficient to demonstrate students' mastery of key concepts and SCANS competencies. Therefore, a career transcript was designed by the Johns Hopkins University team and a commercial company to indicate students' specific levels of achievement. The commercial company had substantial experience in developing software to help organizations' human resource departments make hiring decisions. Through the second cycle of 3-year funding from NSF, project leaders developed and began testing an Internet-based career transcript in 1999. That career transcript was designed to supplement the more traditional college transcript that usually indicates course completions and letter grades.

In individual courses, faculty assessed students as they completed their project-based learning tasks within the specified modules. The main assessment results were initially noted on the special assessment form (see attachment D-1), and then these results were placed into the Internet database career transcript. Students could review and print out their transcripts and decide what information they wanted to share with employers. In addition, students decided what assessment results should go on the career transcript. If students perform well, they will most likely want the results posted on the transcript. However, if students do not perform well, they can decide that certain information should not be included on the transcript. Students may also decide to block certain portions of the transcript from employers in order to tailor the information to the requirements of the particular position that they are seeking. Also, when students repeat certain skills and their assessments in other modules, then only the best efforts will be shown on the career transcript. In the future, it is expected that supervisors at the workplace could also assess performance and then indicate those results on the career transcript. Attachment D-2 includes an example of a career transcript that is organized like a resume by listing the SCANS competencies and levels of achievement.

This career transcript is premised upon the hypothetical resume outlined in a previous SCANS report (1992). The current template for the career transcript was modified as it emerged through discussions between the Johns Hopkins University team and the commercial partner (Alignmark). Future designs of the career transcript will be revised based upon faculty feedback.

Data Ramifications

The career transcript system and its links to the new assessments of student performance in CD-ROM modules were at the beginning stages of development and testing when this case study was conducted. Therefore, the full implications of the data ramifications were not evident. Project teams plan to collect more data over time (as this initiative expands and is refined) that may provide some evidence about the reliability and validity of the assessment methods.

When sufficient numbers of students participate in these new initiatives, the project teams will begin to make comparisons between a control group (which does not participate in these initiatives) and those who do fully participate. Such comparisons might include an examination into whether participating students have higher graduation rates than those who do not participate. Another comparison between these two groups of students may examine course completion rates and their particular levels of competence. Once graduates are in the workplace or in internships, employers may also be asked to evaluate students' performance on the job.

Advantages and Challenges Associated with a Competency-Based CD-ROMs and Career Transcripts

Several advantages were associated with the development and creation of CD-ROM learning experiences that are linked with career transcripts. From evaluation reports, it was clear that students believed they were achieving stronger learning outcomes. Approximately half of the students indicated that they learned new communication and teamwork skills, while two-thirds stated that working through the CD-ROM exercise helped them to strengthen their presentation skills (Gold, 1998). About two-fifths of the students believed they made gains in their critical thinking abilities as well as evaluating different courses of action within a larger context and learning to gather information and analyze it for decision making (Gold, 1998). About four-fifths of the students reported that the module taught concepts or skills that they would have not learned in traditional classes in which they enroll. In particular, students stated that they rarely worked in teams in their traditional college classes (that were not part of this project), even though they did gain teamwork experience in the workplace (Gold, 1998). Since the career transcript was very new, in 1999, there were no systematic results yet about its usefulness from the students' perspectives.

Faculty believed that the CD-ROM learning experiences fostered closer connections between the worlds of work and academics. Through the case-study approach, students worked in teams to solve real-world issues. These learning experiences also encouraged students to use technology more in the classroom, as well as to use their own college computer facilities.

Faculty initially had some concerns and reservations about the career transcript. There was typically only one CD-ROM project-based learning module in a particular course. At the time the case study was conducted, a very small number of faculty used these learning modules at individual institutions. Frequently, only student outcomes from this particular module were assessed for subject matter and SCANS competencies that were then placed on the career transcript. If this module were the last learning experience within a course, it would serve as a "capstone" experience and faculty would feel comfortable in relying on the assessment results in the transcript. However, the modules can be embedded at any point from the beginning to the middle of the course, too. Therefore, some faculty believed that the career transcript only shows student performance for one-fifth of the course. Some faculty were concerned that employers may think that the results are based upon extensive assessments across cumulative learning experiences. This challenge was illustrated at Hagerstown Community College, where only two students had taken more than one module for which results could be indicated on the career transcript. In addition according to some faculty, employers were confused about how students were assessed, which potentially leads to difficulties in making interpretations about the assessment results.

Some faculty did not clearly understand the purposes of the career transcript. Perhaps since this was such a new part of the initiative, some faculty did not fully comprehend how the career transcript would be developed and what its potential usefulness was. However, some stated they would like to have more input into the actual development of this transcript.

The format of the career transcript was still emerging. It appeared that the leaders of this project were working to get feedback from both faculty and employers about the structure, organization, and content of the career transcript to make it useful and meaningful.

Another challenge for faculty at Hagerstown Community College was that this type of innovative work had not been widely supported by their colleagues at their own institution. Some faculty

did not see a need for substantial change since they feel fully committed with heavy teaching loads and major student advising responsibilities. Reasons cited for this lack of widespread change to a more project-based learning approach by some of the instructors included the belief that the lecture-centered approach works best and the feeling that it is very difficult to incorporate these types of modules into a traditional classroom. Faculty were sometimes reluctant to integrate the CD-ROMs into courses that were already fully programmed, especially when these types of projects were only viewed to tangentially address the academic material presented by some faculty (Gold, 1998).

Related concerns exist about the major amount of time to revise a course into a student-centered approach that uses cases or project-based learning experiences. Potential faculty adopters may perceive this type of initiative to be a substantial cost that outweighs the benefit. Although only a small nucleus of faculty from Hagerstown Community College were involved in this project, they did report ongoing discussions with their peers in an effort to convince them of its usefulness and value. Senior administrators were convinced of its importance and provided release time from courses for faculty to design and implement the modules into existing courses and to evaluate them.

Another challenge for this particular effort is that faculty needed updated and state-of-the-art computers. Although students usually have access to current technology, some faculty (from the most recent faculty development seminars) stated that they have old and outdated technology. Some faculty also lacked adequate support from their technology experts on campus. This created a potential barrier for faculty trying to adopt these innovative CD-ROM learning experiences. Fortunately, faculty at Hagerstown Community College had appropriate computer hardware and technology available. However, the technology issues were challenging for faculty at other institutions who were trying to adopt the CD-ROM learning experiences.

Recommendations for Other Colleges and Universities

A strong faculty development plan was cited by professors as extremely important to the success of building competency-based modules. The consortium under the leadership of Johns Hopkins University designed a sophisticated professional development program for individuals interested in implementing these transferable modules into their own courses. The main purpose of this program was to disseminate these modules to professors at similar colleges and to prepare faculty teams to become change agents at their own institution. Teams usually included four or more individuals and one senior-level administrator.

These change agents will decide which particular existing modules (developed through the NSF grant) can be incorporated into their own courses and then train others in "new ways of instructing, assessing, documenting, and reporting student learning and competency achievement" (Mathias, 1999a, p.1). The vision was that these new institutional partners will actually implement the CD-ROM modules into certain courses including the use of standard assessment instruments and build career transcripts for participating students. All institutional partners would continue implementation and documentation of student learning outcomes through the end of the project in August 2001.

The faculty development program currently extended over an 8-month period. Participants worked through guided independent learning activities. They received overviews of the CD-ROM case studies so that they could make informed decisions about which module was most appropriate for their particular courses. Faculty reviewed learning modules to better understand

the content, organization, and technology associated with its delivery. They were also mentored throughout this development stage through a Web-Based Electronic Learning Community, which includes face-to-face video conferencing sessions (Mathias, 1999b). This approach was designed to help faculty successfully navigate a challenging change process. Electronic mentoring offered participants time to share insights, challenges, course outlines, and best practices.

Participants were also expected to attend a 3-day seminar offered by members of the consortium who worked with 16 different college teams from across the United States. Substantial time was devoted to helping faculty understand their changing roles from the authoritative expert to the project-based and team-oriented facilitator who help students learn to collaborate. In addition, faculty usually needed assistance identifying important competencies and designing the appropriate assessment methods. In summary, the main topics at this seminar included how to blend complex, industry-based problems into traditional academic coursework, manage students working in teams, facilitate problem-based learning, integrate technology, and assess and document student achievement using the SCANS competencies (Mathias, 1999).

Strong support from senior central administrators was critical. Faculty strongly believed that release time from courses was essential as instructors strived to dramatically change their traditional classrooms. Without release time, faculty did not get sufficient time to develop and revise their courses. These changes were very substantial for faculty, and they needed the time to reflect, develop new ideas, and get feedback on their plans from their colleagues.

Conclusion

The faculty who were engaged in this innovative work were highly motivated to change their classrooms into a more project-based and team-oriented environment. Through major training initiatives, faculty were encouraged to think about new ways to work with students and develop real-world problems with multiple solutions rather than the one "right answer." Faculty successfully developed new learning experiences using CD-ROMs. They were disseminating this information to other colleagues and training new adopters. The modules were transportable into the appropriate courses at other colleges and universities. Transportability was also enhanced since modules built upon the SCANS (1992) competencies that have widespread acceptance in certain professional fields.

The creation of the career transcript has the potential to build stronger bridges among faculty, students, employers, and supervisors of internship or clinical experiences. The articulation of specific levels of achievement mastered by students will be important to share with multiple audiences. Employers will have more useful information to make judgements about the quality of their potential employees. This endeavor was very new and will take some time to gain acceptance about its value and use. However, ongoing consultations with all affected constituencies should increase the likelihood of its success.

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Attachment D-1

AES Skill@ **COACH**

HAGERSTOWN COMMUNITY COLLEGE
STUDENT PERFORMANCE ASSESSMENT[1]

Date: _____ Assessed By: Supervisor_____Self _____Peer_____

Other_____

Student Name: _____Student ID #___

_____

Campus_____Department _____Program _____Sub-Set _____Faculty_

Carson: Course: Mathematics _____Objective: Entrepreneurial Mathematics CD

Outcome: Solve Advertising Problem

Outcome Scoring Key: Command of Subject
1=No Understanding 2=Little Understanding 3=Basic Understanding 4=Sufficient Understanding 5=Expert

1 2 3 4 5	Determines objective statement
1 2 3 4 5	Defines constraints
1 2 3 4 5	States problem mathematically
1 2 3 4 5	Employs CAS and/or spreadsheets for calculating successful solution
1 2 3 4 5	Applies the above 4 steps for each different media type
1 2 3 4 5	Converts data to sales projections
1 2 3 4 5	Determines alternative solutions for other price points

Process Scoring Key: Command of Subject
1=No Understanding 2=Little Understanding 3=Basic Understanding 4=Sufficient Understanding 5=Expert

Level of Difficulty: 1 2 3 4 5
Process Skill: F9 - Problem Solving

INSTRUCTIONS: Fill in the number which best describes the degree of effort demonstrated by the student in this task.

1 2 3 4 5	Clearly defines the problem
1 2 3 4 5	Seeks probable causes of the problem
1 2 3 4 5	Sets criteria for successful solution of the problem
1 2 3 4 5	Considers alternative solutions
1 2 3 4 5	Identifies likely outcomes for each alternative
1 2 3 4 5	Implements an alternative that meets selected criteria
1 2 3 4 5	Monitors progress of proposed solution

[1] Material copied with permission of Elizabeth Mathias.

Attachment D-2

Hagerstown Community College
SCANS Transcript for
Sample Tester
As of 7/14/99[2]

SCANS Skills			
Resources	Interpersonal Skills	Information	Systems
Technology	Thinking Skills	Personal Qualities	

SCANS Skill	Date Test Taken	Source of Information	Performance
Allocates Time			
	7/14/99	AES International Skill Coach Assessment	For an Entry Level Employee, prepares and organizes multiple schedules, manages timelines, and recommends timeline adjustments, with 80-89 percent proficiency.
Allocates Materials			
	7/14/99	AES International Skill Coach Assessment	For an Entry Level Employee, orders and maintains inventory, and monitors safe and efficient utilization of materials, with 70-79 percent proficiency.
Allocates Space			
	6/25/99	Nurses Aide, Johns Hopkins Hospital	Noticed that the office arrangement impeded patient traffic flow in doctor's office and rearranged the furniture to accommodate a better flow.
Teamwork			
	1/23/98	AccuVision WSS	For Actively acknowledges and recognizes the positive work efforts and accomplishments of team members this participant performs acceptably.
General Interpersonal Skills			
	1/23/98	AccuVision WSS	The performance of this individual on the AccuVision WSS assessment indicates a 90 percent probability of success in Interacting with Others.

[2] Material copied with permission of Elizabeth Mathias.

Hagerstown Community College
SCANS Transcript (continued)

Acquire/Evaluate Data			
	7/14/99	AES International Skill Coach Assessment	For an Entry Level Employee, analyzes data, Integrates multiple items of data, and contrasts conflicting data, with 80-89 percent proficiency
Identify, Understand, and Work w/Systems			
	7/14/99	AES International Skill Coach Assessment	For an Entry Level Employee, analyzes system configuration/stability, and recognizes system strengths/limitations, with 70-79 percent proficiency.
Maintain & Troubleshoot Equipment			
	7/14/99	AES International Skill Coach Assessment	For an Entry Level Employee, implements technological improvements/changes and generates technological solutions, with 60-69 percent proficiency.
Reasoning			
	1/23/98	Nurses Aide, Johns Hopkins Hospital	Doctor noted client's creative thinking skills when addressing problems and developing solutions.
Responsibility			
	1/23/98	AES International Skill Coach Assessment	For an Entry Level Employee, monitors performance standards and follows up on assigned tasks, with 90-100 percent proficiency.

APPENDIX E

Community Colleges of Colorado Incumbent Worker Project

Introduction

The purpose of this case study is to explore the beginning development of the Incumbent Worker project funded by the United States Department of Labor as one of 12 national demonstration grants. A consortium of community colleges and businesses are formally collaborating to address the employment needs within the state of Colorado. This site was selected since the training initiatives will include competencies and performance objectives for employees.

In spring 2000, four individuals were interviewed about this particular initiative. The participants included individuals who directly provide leadership for the planning and implementation phases of work associated with the Incumbent Worker Project. Each individual interview during the site visit ranged from 30 to 60 minutes. The Working Group consultant reviewed numerous documents including the original grant proposal and information outlined in private Web pages. Since much of the work is still under development and planning, there were limited materials to review at the time of the case study.

The Setting

Employers want a new kind of professional with a broad set of workplace skills and a strong foundation in the basics that will facilitate learning and retention in new positions. Deficiencies in many basic skills (including effective writing, speaking, or reading) are barriers for entry-level employees and dislocated workers attempting to adapt to economic and technological change within diverse companies (Carnevale, Gainer, and Melzer, 1990). Employers believe there is increasingly a gap between the skills that they need from their new employees and the actual skills that such employees demonstrate. In reality, many new employees and dislocated workers do not meet the requirements of their new jobs and particularly lack the basic skills.

Employees are challenged to improve their basic skills through training opportunities to become competent in their jobs. Some major reports indicate that the expectations for effective performance are much higher today than in previous decades due to major changes in business environments (Business-Higher Education Forum, 1997; Carnevale, Gainer, and Meltzer, 1990). Therefore, the gap between the skills required for effective performance and the actual performance of employees is increasingly wider (Business-Higher Education Forum, 1997).

Colorado's economy reflects the issues that face many states today. In fall 1998, employers who participated in the Denver Workforce Summit reported that their main concern was the weaknesses in employees' basic skills and the shortage of qualified workers for job openings (Community Colleges of Colorado, 1999). They found that 7,000 technology jobs are unfilled in the state, and that number is projected to reach 30,000 in the next decade. They also reported major shortages in the supply of trained workers in the fields of technology, advanced manufacturing, and telecommunications as well as other technical jobs.

The Community Colleges of Colorado (CCC) is providing leadership for this 2-year, Department of Labor grant. CCC consists of 14 partner colleges with the local governing entities, under a central office with an Executive Director and Staff. Each of these colleges has a training division

and an instructional division that designs and delivers learning to corporate and small business customers.

The grant has two major purposes. First, training services will be offered directly to incumbent workers at certain companies. Second, a state-level college training support system will enhance local company/employees services. Leaders of the grant expect that at least 4,350 incumbent workers will receive necessary services. Each community college is in a strong position to work collaboratively with industries since they each have a business service unit on campus that includes experienced assessment and training staff and managers (CCC, 1999).

The targeted population of potential participants for training opportunities (designed by the community colleges in Colorado) include the following:

- New and recent hires;
- Employees who have been targeted for retention attention;
- Non-English-speaking employees;
- Employees who will lose employment when the company upgrades to electronic systems;
- Employees with obsolete skills;
- Employees who can be promoted if they learn new technical skills required by the company;
- Employees who lack basic reading, writing, math skills and therefore cannot be trained; and
- Employees whose hourly wage is less than the company average per grade.

CCC has named 9 of its system's community colleges and 18 different companies to address employment needs in Colorado. Each of the nine community colleges has established a training relationship with one or more local companies to offer specific types of classes or modules for specific employers. For example, the Community College of Denver is creating modules on business writing, career development, resume writing, interviewing techniques, communications with a diverse workplace, customer service, telephone skills, time management, team building, and conversational Spanish for Children's Hospital. The Community College of Aurora is focused on customer service for AT&T Cable Services. Pueblo Community College is responsible for designing basic computer applications learning experiences for Parkview Medical Center. Front Range Community College is working with Sun Micro Systems on the Star Office (a particular type of computer application suite that includes word processing).

Specific criteria for making decisions about participating companies for this particular project included the following:

- Show evidence of commitment to employee development, particularly if they had a series of programs already initiated;
- Provide matching funds and other resources to the project;
- Work collaboratively with the community college and with other companies; and

- Experience incumbent worker development problems that could be reasonably addressed by the project (for example, high turnover rates).

In 75 percent of these companies, more than half of the employees are targeted for assistance, suggesting a sizable commitment. Interviews with company personnel indicate that as many as 45 percent of these employees are severely lacking the basic skills and/or English proficiency (CCC, 1999).

A major portion of the grant is dedicated to creating the Colorado State Training Solutions Center (TSC). Business training professionals from the community colleges have found that training and services must be delivered more quickly and in more varied delivery formats to better meet the growing training needs of local companies and the many different learning styles of employees (CCC, 1999). Typically, most professional staff at colleges have very little time to create or modify training modules since they are primarily responsible for managing training sessions and implementing assessments. The TSC is to address employment issues by overseeing the creation, revision, and delivery of training modules as soon as they are needed by different companies.

TSC proposes an electronic storage and retrieval system so that partners can have access to a wider range of materials for their use and modification. Since these materials are modularized and their delivery formats will be standardized, partners will be able to draw upon and assemble different types of modules into new course offerings.

This project will provide for the creation of the standardized formats for the training modules and distribution process. Instructional design staff (often from the community colleges) will work with the specific training division and the company, as is typically the case for customized training. Designers from partner colleges will create and test modules during the grant period. The content that each partner will contribute is the result of training needs determined with the partner companies named in the grant. This center could help college training divisions respond more quickly and efficiently to the needs of employers in the state.

TSC is housed within the CCC Career and Technical Education Resource Library located at the Higher Education Advanced Technology Center on the Lowry Air Force Base Campus in Denver. By offering customized training materials, advanced delivery system solutions, and train-the-trainer opportunities, it will help local college workforce-training divisions and their workforce partners to be more effective in working with incumbent workers and their employers (CCC, 1999).

Identifying Important Outcomes

The Training Solutions Center Curriculum System is envisioned to consist of a competency-based, modularized curriculum and an electronic storage and retrieval system of workplace learning and performance materials (CCC, 1999). The electronic and retrieval system is anticipated to support both group and independent-learner models with various formats including instructor-led classroom training, Web-based instruction and performance support, CD-ROM, video, and audio.

The leaders describe their vision for the competency-based curriculum as a model that defines the creation and delivery of learning content through stated expectations of learning and performance and provides for measurement of the results. Competency is specifically defined as the

"knowledge, skill, or attitude that enables one to effectively perform the activities of a given occupation, or function to the standards expected in employment" (The International Board of Standards for Training and Performance and Instruction: http://www.ibstpi.org/idrevised.html). A performance objective is defined as what the learner can expect to do as the result of a training module (show knowledge or demonstrate a task). It is typically a more detailed level of learning and performance than a competency. It defines what performance can be expected. It also names conditions of performance and is stated in terms that are measurable and observable (see attachment E-1). Modules are units of learning defined by the performance objectives. Courses are a set of modules presented as a unified learning experience.

The training divisions at the community colleges will identify the important outcomes needed for the training experiences, often through multiple methods. Staff will make phone calls to business managers or conduct interviews and focus groups as well as survey the employees at the specific companies about their training needs. Interviewed participants for this case study primarily identified training needs with business managers or training units through a few phone conversations.

At the time of the interviews, project staff were constructing a sample of modules. Most of these learning experiences will be refined when they are tested in summer 2000. The vision is that most of these modules will vary from taking about 15 minutes to 1 hour to complete. It is anticipated that employees could take several modules to address specific needs. Some training experiences could be 1 day in length, typically running from 4 to 6 hours. For most modules, employees would either pass or fail. While single modules will not have academic credit attached, it is possible that a series of related modules may lead to either a certificate of successful completion or the award of academic credit.

Currently this project is moving toward developing stated competencies. Each module begins with the identification of performance objectives. At a future date, performance objectives will be linked and articulated back to academic competencies to facilitate the assignment of potential academic credit. As businesses become more experienced in developing company learning around position-based competencies, performance objectives can be expressed in relation to company or industry-defined competencies.

Leaders of the Incumbent Worker Project are creating a curriculum design process that involves eight major steps leading to the implementation of training modules (see http://www.coloradotraining.org). The TSC will maintain and oversee the development of these modules. The majority of modules are currently under development.

The major steps in this process are to:

- Conduct a training needs assessment with the customer (frequently through interviews with the client);
- Apply the learning domain (cognitive, affective, and/or psychomotor) concepts to training needs;
- Apply task analysis to desired outcomes and determine prerequisite modules;
- Write a performance objective for the module;
- Identify assessment (measurement) of performance objective;

- Determine content that will allow the learner to successfully achieve the performance objective;
- Apply process for designing module layout and design; and
- Review and revise materials.

Ideally, each instructor-led module must explain or address the following points:

- Identification of the audience it is designed for (manager, technical staff, customer service, or front-line/entry-level employees);
- Curriculum format (print/instructor-led in classroom, PowerPoint, Web, CD-ROM, video, audio, book, part of course, module only, or other format);
- Title of module;
- Developer's notes (required to indicate a description of the module including the performance objectives being drawn upon);
- Prerequisites (including specific baseline skills in addition to prerequisite modules);
- Complete module outline (including content with list of terms and their definitions);
- Assessment methods; and
- Scoring guide (provides correct answers for objective tests or observable characteristics necessary for satisfactory performance in achievement tasks).

Assessment Strategies for Modules

Assessments are designed by the training curriculum designers and are intended to measure student learning before and after the delivery of the module. Types of learning assessments will include paper-pencil tests (e.g., multiple choice, true/false, and short answer) or demonstrations of learning through applied tasks (see attachment E-1 for an example currently under development).

During the training experience, participants will be asked for feedback about whether the training material matches their needs. If it does not match, then the trainer will be able to revise the learning experience to better fit employees' needs. At the end of the training, formal evaluations will be conducted to determine the value of the learning and employees' satisfaction. Some partners may also do followup evaluations at the workplace 1 month after the training by asking employees about changes in their behaviors (related to the purposes of the training) and by asking supervisors about changes in the employees' performance.

Project staff expect formative assessments to provide learners with results and feedback that can be used to determine progress with material. Summative assessments of employees will indicate passing results or failing scores. Other potential measures to evaluate the impact of the grant itself include employees' retention rates in their positions (for those who participated in the training experiences) and employees' rates of promotion or wage gains within the company. Validity and reliability are issues that the curriculum leaders are beginning to consider, and relevant data will be studied as the assessments are implemented later this year.

Advantages and Challenges Associated with Systemwide Shared Training Modules

The project leaders emphasized that research demonstrates that performance-based learning is very important to employers for the results it produces in the workplace. The modularized approach that has been created should help the trainers to develop stronger learning experiences that respond more quickly and efficiently to the changing needs of the workplace. Separating the learning experiences into modules allows for timely revisions of content as needed and enhances the tailoring or customizing of training for particular companies. As project leaders fully implement this initiative in the summer 2000, they expect that individual modules will be transportable to meet the needs of different companies or other community colleges. Since this project is at the beginning stages of planning, there are no data or assessment results yet to determine the particular dimensions that are working well and what could be improved.

Several challenges are associated with the planning for this ambitious initiative. Individuals who are developing modules have seldom systematically thought about all of the required segments as outlined in the curriculum planning process. Prior to this project, none of the individuals wrote specific performance objectives or directly linked those objectives with the design of assessments. The project leaders did provide classes for designers to learn about the design concepts related to the curriculum. After designers submitted an initial module, they participated in an individual feedback session with project leaders.

These are new learning experiences for the curriculum developers, who reported some challenges in generating the required parts for each module. The leaders of this project identified the competency-based model with performance assessments as the key to delivering the types of learning experiences that employees need to become improved workers. This model has posed some challenges, particularly at the implementation phase, because the training divisions in the community colleges are trying to address the individual business performance employment system needs, industry standards, and vocational skill standards for higher education programs. In addition, CCC is establishing common course numberings across the system's 14 colleges that may result in the establishment of common course competencies.

Some individuals are concerned that there will not be enough iterations to test the modules before they are fully implemented. In a private Web page designed only for project participants (at this time), numerous Web resources are outlined to help instruct individuals about how to document their modules. In addition, specific terms are defined and examples are provided for each required reporting element (such as performance objectives and assessment). The project leaders provide curriculum planners with feedback about how to strengthen their modules.

Curriculum planners want to develop performance objectives that both employers and their employees will understand. However, another challenge is the articulation of performance objectives that will be transferable and not solely dependent upon a particular module useful in only one corporate context. The goal for the curriculum planners is that these experiences will be transferable, but employers tend to mainly consider their own context. In addition, curriculum planners want the performance objectives to be specific enough to guide the learning experiences as well as the appropriate assessments. At times, employers may use broader language, but the curriculum planners must take broad concepts and translate them into useful performance objectives.

Individuals also reported that this curriculum planning process takes considerable time. There is some concern that not enough resources have been allocated to support the development of these

modules. Some individuals report doing this work (including the administration and coordination) as an overload and are concerned that this may affect the quality of their outcomes.

Community college presidents signed formal letters agreeing that the curriculum developed through this initiative would be owned by the project. Although participating colleges agreed to share their curricula, there are still issues that need to be resolved when employers develop their own proprietary curricula. The Training Solutions Center will accept generalized content that is not specifically linked to individual businesses. But in order to be part of this initiative, individuals must agree to share their modules.

Recommendations for Other Colleges and Universities

An important recommendation from project leaders is the creation of an environment where risk taking is encouraged and supported. Such an environment needs to foster collaborations by working with individuals who are ready to try new ideas. It is important to partner with industries and to be responsive to their needs. The project leaders suggest that developing an incremental plan is best by identifying small steps that can be realistically achieved in certain time periods. With experience, these plans can be enhanced and built upon as individuals learn about what works best and what can be refined. Some individuals believed that it is easier to begin this type of work with the technical fields (such as computer technologies or nursing), where there are frequently right and wrong answers. As this project advances, the leaders will learn more about the success of their own experiences too.

Conclusion

The Community Colleges of Colorado Incumbent Worker Project has the potential to directly address key issues facing employers in the state. Through a formal collaboration among community colleges and certain corporations, learning experiences will be designed and implemented in an effort to improve the performance of new and dislocated workers. Such learning experiences should also help these employees to be retained in their positions (or to become employable in the workforce) as they become stronger assets to their companies. The transportability of these modules should aid other community colleges in different states that may be facing similar issues. A national clearinghouse of modules could be exchanged across sectors and more directly meet their needs. In the future, formal assessments of participants' learning through multiple methods will actually inform the degree of success with these partnerships.

References

Business-Higher Education Forum. (1997). *Spanning the Chasm: Corporate and Academic Cooperation to Improve Workforce Preparation*. Washington, DC: Business-Higher Education Forum.

Carnevale, Anthony P., Gainer, Leila J., and Meltzer, Ann S. (1990). *Workplace Basics: The View from the Corporation*. San Francisco: Jossey-Bass.

Community Colleges of Colorado (CCC). (1999). Emerging Partnerships for Large Employers: Training Solutions for Colorado's Incumbent Workers. Grant proposal submitted to the U.S. Department of Labor. Denver, CO: CCC.

Attachment E-1

Developer's Notes: Introduction to StarOffice™: Using StarWriter 5.1[1]

Audience/Context:

The modules of this course are designed to provide an overview of the basic features of StarWriter, the word processing component of StarOffice™ Version 5.1. The modules are suitable for anyone with basic computer skills; familiarity with other word processing applications is not necessary.

The total course is comprised of six modules:

1. StarWriter Fundamentals
2. Formatting a Document
3. Editing a Document
4. Styles and Templates
5. Using Graphics and Other Objects
6. Converting Files

Estimated Instructional Delivery Time:

- The delivery time for Modules 1 – 5 is **75** to **90** minutes.
- The delivery time for Module 6 is **15** minutes.

Performance Objectives for these modules:

1. Identify the basic features of StarOffice™, navigate its user interface, and create and open documents in StarWriter.
2. Format documents using the full complement of StarWriter features.
3. Edit and proof documents using StarWriter tools.
4. Use StarWriter style features to manage formatting
5. Integrate graphics and other objects into StarWriter documents.
6. Convert documents between StarOffice™ and Microsoft Office™.

Domain and level objectives are drawn from:

All of the modules and their objectives are drawn from the cognitive domain (understanding and application levels) and psychomotor domain (imitation and practice levels).

Pre-requisite Modules:

None

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[1] Material copied with permission of Alice Bedard Voorhees.

Baseline Skills:

Basic computer skills (using the keyboard and the mouse) are required. Experience with other word processing applications is not required, but is helpful.

Classroom Prep:

Each module includes hands-on exercises for practice with basic features covered. The needed files for those exercises are provided in the Using StarWriter folder. That folder contains two subfolders:

- **StarWriter Class** – the practice files used for hands-on exercises as well as for assessments.
- **Instructor** – files that contain completed assessments for the evaluation of student assessment exercises.

It is recommended that the **StarWriter Class** be copied to the StarOffice Work Folder for ease of access during the class. If the files are placed elsewhere, the instructor will have to guide students to the appropriate location.

Assessment for *StarWriter Fundamentals* Module:

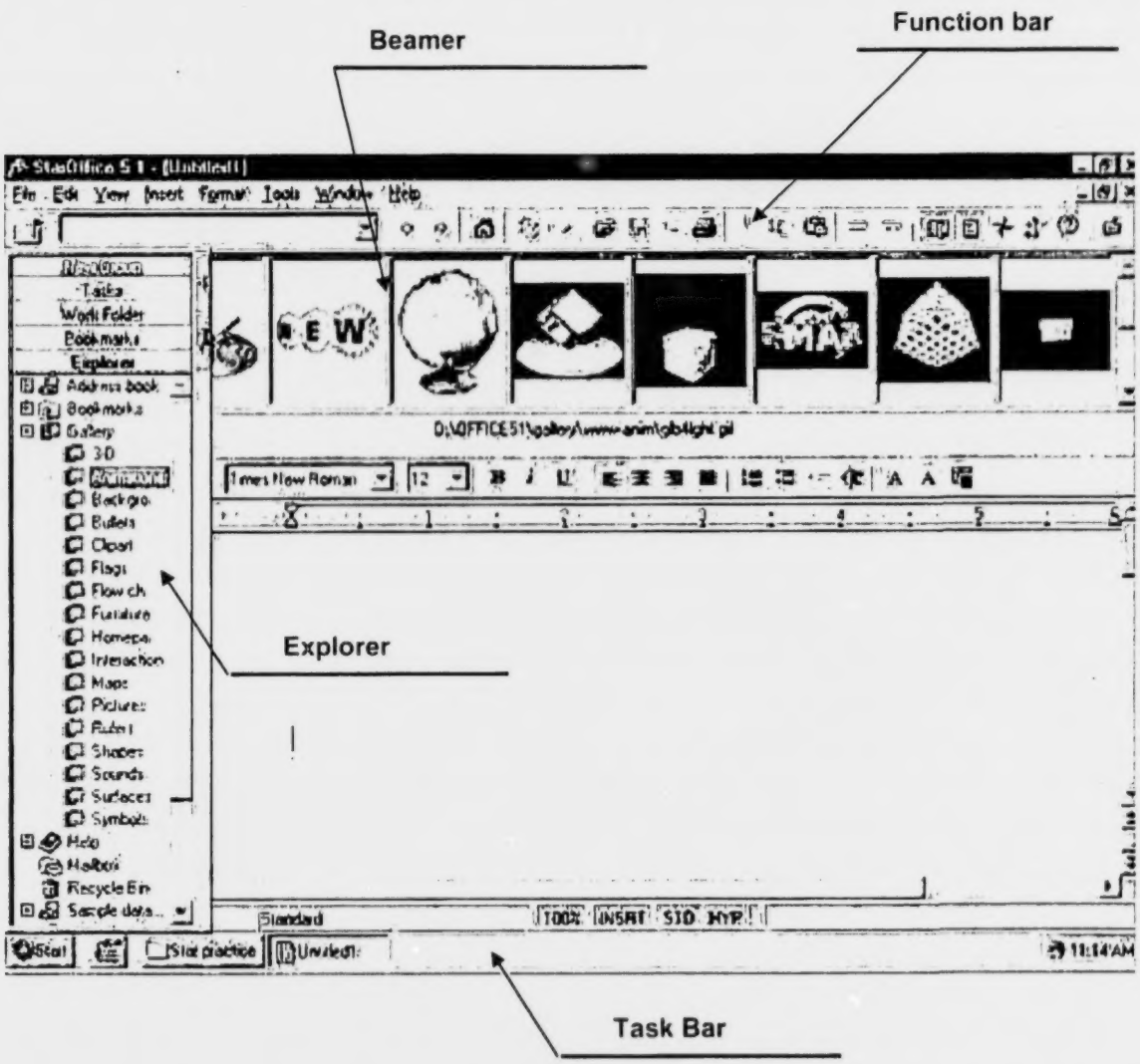
1) Complete the following: (One point per correct answer)

StarOffice is an office suite that includes all the essential functions needed for business use, such as word processing, spreadsheets, and presentations.

Name the components of StarOffice used for each listed function:

- Word processing **StarWriter**
- Spreadsheets **StarCalc**
- Presentations **StarImpress**

Identify the various elements of the StarOffice workplace, using the illustration on the next page:



BEST COPY AVAILABLE

Complete the following steps. When done, have the instructor check your work.

a) Open the file "declaration.sdw" in the *StarWriter Class* folder.

b) Display the nonprinting characters in the document.

c) Change the zoom setting to "Page Width".

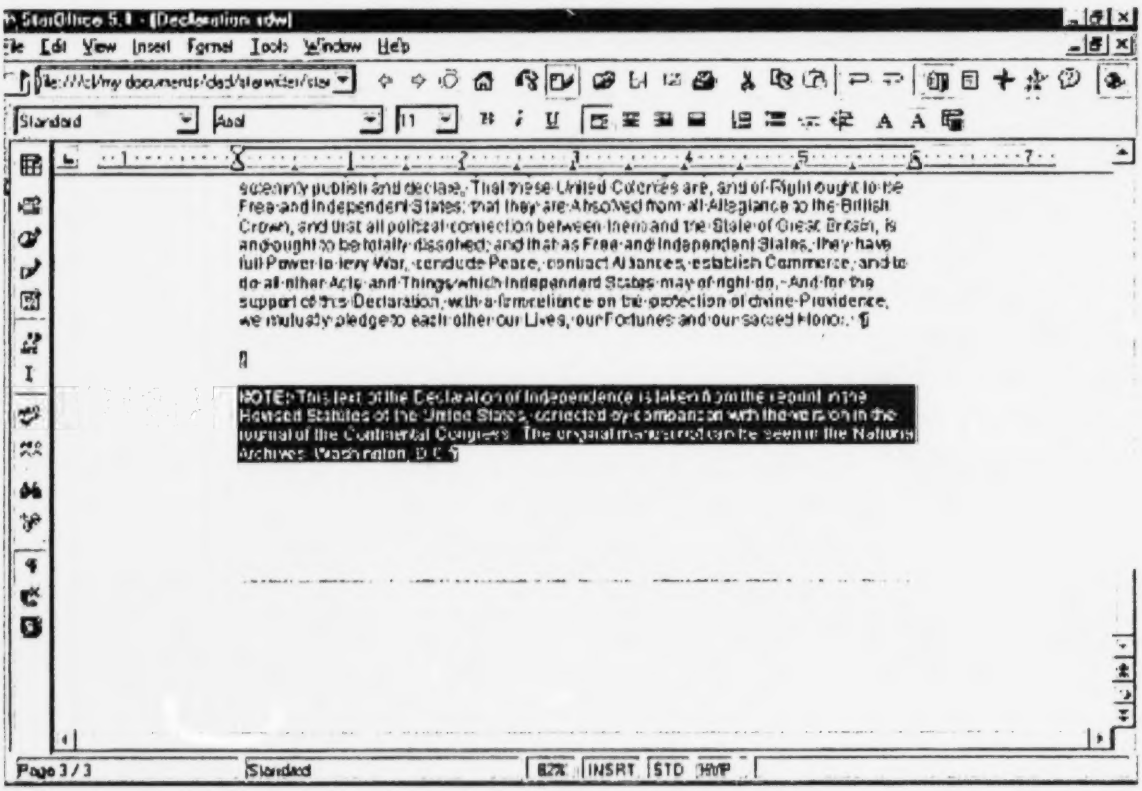
d) Move to the bottom of the document.

e) Select the last paragraph (beginning with "Note: …")

f) Ask the instructor to check your screen.

Answer: The screenshot below illustrates the correct completion of the steps for #2. Check the student's display for: **(One point for each of the following)**

- The file "declaration.sdw" is open
- Nonprinting characters are turned on.
- Zoom setting to Page Width (both edges of page are visible on the display).
- Last paragraph in the document is selected.


File Edit View Insert Format Tools Window Help
Standard
Arial
12
solemnly publish and declare, That these United Colonies are, and of Right ought to be
Free and Independent States; that they are Absolved from all Allegiance to the British
Crown, and that all political connection between them and the State of Great Britain, is
and ought to be totally dissolved; and that as Free and Independent States, they have
full Power to levy War, conclude Peace, contract Alliances, establish Commerce, and to
do all other Acts and Things which Independent States may of right do. And for the
support of this Declaration, with a firm reliance on the protection of divine Providence,
we mutually pledge to each other our Lives, our Fortunes and our sacred Honor.
NOTE: This text of the Declaration of Independence is taken from the reprint in the
Revised Statutes of the United States, corrected by comparison with the version in the
Journal of the Continental Congress. The original manuscript can be seen in the National
Archives, Washington, D.C.
Page 3 / 3
Standard
82%
INSRT
STD

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2) Create and save a new document starting from a blank text document.

a) Create a new blank document.

b) Type in the following text in the document:

> Creating a new document is very easy in StarWriter. You can start from a blank document, or you can use templates to create special documents like fax cover sheets or memos.
>
> It is helpful to display nonprinting characters while creating or editing a document. With nonprinting characters turned on, you can easily see how the structure and spacing in the document has been created.

c) Save the document as "practice1" in the *StarWriter Class* folder.

d) Close the document.

Answer: Check the student's files for the completed file "***practice1.sdw***". The document should correspond to the file "***assessment1.sdw***" in the "Instructor files" folder.

(Two points for entering text in document with word wrap; two points for correctly saving the document).

Overall Evaluation:

Question #	# Points	Satisfactory
1	7	4
2	4	3
3	4	4
Overall	15	11

APPENDIX F

Western Governors University

Introduction

The purpose of this case study is to explore the competency-based degree programs in place at Western Governors University (WGU). WGU is a newly incorporated institution that has dual missions for delivering competency-based degrees and brokering of distance-delivered education.

In fall 1999, the Working Group consultant interviewed five individuals. Interviews lasted from 30 to 60 minutes or were conducted by email. Two people that work for the initial contracting agency that created and developed the first competency-based offerings were interviewed. One of them continues as an ongoing member of the WGU Assessment Council; a second is a full-time faculty member and department chair at another institution who also sits on the Assessment Council. Finally, two WGU administrators—the Senior Academic Officer and the Director of Assessment—were interviewed. Additional information gathered and reviewed from the WGU Web Site (www.wgu.edu) is from documents on degree development and assessment procedures.

This case study begins with an overview of Western Governors University followed by an explanation of their competency-based degrees. Then assessment strategies used by WGU are outlined in addition to a discussion of issues of reliability and validity. Methods for how student learning is documented precede a discussion of the data ramifications of WGU competency-based degrees. Finally, advantages and challenges faced by WGU are given prior to concluding with recommendations for other colleges and universities considering offering competency-based degrees.

Overview of Western Governors University

As parents and students increasingly worry about degree and course articulation and employers question the credibility of college degrees as evidenced by graduates' usefulness in the workforce, governors seek avenues to answer these concerns. In the western region, one answer was the creation of Western Governors University. In 1995, governors of most of the western states working in conjunction with the Western Governors' Association agreed to develop an accredited postsecondary educational entity that would address these issues. Western Governors University, a private nonprofit postsecondary institution, was incorporated in January 1997. In the summer of 1999 students were first admitted; at this time, the accreditation process is underway. WGU is designed to broker an array of distance-delivered learning opportunities from both traditional postsecondary providers and corporate providers to students from across the country and the world. In addition, WGU offers competency-based programs of study that are designed to recognize knowledge and skills learned through work and life experiences. The certificates and degrees, especially those developed initially, support welfare-to-work initiatives as well as create opportunities for the geographically dispersed clientele of WGU. Their competency-based degrees actively allow students to use past experience toward degree completion. It is believed that this aids in accelerating student progress to graduation.

Competency-Based Educational System

All WGU degrees are competency-based. The degrees being developed are predominantly at the Associate of Applied Science and Associate of Arts level, because information indicates these are most needed in the western region of the United States. In addition, master's degrees in selected disciplines are also being created. Baccalaureate degrees are not the primary focus because WGU administrators want to focus on specific workforce development needs that call primarily for associate's level degrees and because bachelor's degrees are being adequately offered by existing postsecondary institutions.

The basic building blocks of WGU degrees are individual competencies—"performance descriptions" in WGU parlance. At WGU, they are the smallest unit of describable skill or knowledge and are the foundation on which everything else is based. A collection of performance descriptions make up a "domain" that corresponds to a body of knowledge roughly equivalent to a sequence of courses in a traditional degree program. Similarly, a WGU degree comprises several domains (usually six or seven). The initial developers of the WGU degree structures found that using competencies allowed for greater flexibility in program and degree design, making possible the linking of subject matter in fresh combinations. Subject matter "modularized" in this manner allows sharing of topics and competencies between and across degrees. Modularization also allows for generic, semi-generic, and specific job-related competencies to be collected together and shared in new configurations. For instance, all Associate of Applied Science degrees at WGU require the same math domain or collection of similar competencies—Applied Quantitative Reasoning—that corresponds to the basic math course sequence a student might take at a community college. Similarly, all associate's degrees require the same math domain—Mathematics and Quantitative Reasoning—which contains more knowledge and skills than the math domain required for the AAS degrees but has embedded within it most of the Applied Quantitative Reasoning domain. (Exhibit 1 has been designed to illustrate this property by listing the contents of these two domains side by side.) This use of the modular structure supports internal articulation from one type of degree to the next (Associate of Applied Science degree to associate's degree, etc.). Instead of students re-learning subjects from earlier in their academic progression, they are able to move to the next level in the subject area with less repetition. Another use of the modular structure is that many degree types (AAS, associate's, baccalaureate) may require the same domain. In these ways, WGU believes that modularization allows for new methods of mixing and matching knowledge based on new visions of how thinking, learning, and work occur in the 21st century.

Because seat-time is not the building block of WGU degrees, there are many paths students can take to completion of any of the WGU degrees. Unlike most postsecondary degree programs, which come with a list of required courses that are to be taken in a suggested order, at WGU the number, type, and order of learning opportunities taken by a student depends on what that entering student's academic needs are. Upon entering a degree program, a student is asked to work with his or her Advisor-Mentor to catalog and evaluate any prior academic and all work history and life experiences. Entering students also take the COMPASS placement examination in order to determine their math and English competency levels upon entry. These processes establish personal baseline levels of strength and weakness in a variety of academic areas for the student, note where improvements are possible, and help the student and Advisor-Mentor identify educational offerings that meet the student's learning style. The student's Academic Action Plan is meant to be adaptive to the student's needs, but it also includes realistic timelines of projected dates for sitting for assessments and progressing toward a credential. When signed by the student, this Academic Action Plan constitutes her or his learning contract with WGU (but one

Exhibit 1.—Structures of WGU Associate of Applied Science in Electronic Manufacturing Technology and Associate of Arts Degrees[1]

Associate of Applied Science Degree
Electronic Manufacturing Technology

Applied Quantitative Reasoning Skills
Arithmetic/Algebraic Skills
Statistical/Probability Skills
Quantitative Problem-Solving Skills
Quantitative Communication Skills
Quantitative Technological Skills

Applied Language and Literacy Skills
Reading Skills
Writing/Information-Recording
Presentation-Related Skills
Interpersonal Communications Skills
Basic Information Retrieval Skills

Basic Work-Related Skills
Basic Observational Skills
Learning from Role Models
Monitoring and Evaluating Own Performance
Personal Professional Qualities
Completion of Tasks/Assignments to Client or Supervisor Specifications
Tools and Techniques for Working with Others
Personal and Organizational Responsibility and Ethics
Learning Skills

Distribution Domain
Natural Sciences (one course-equivalent outcome examination)
Social Sciences (one course-equivalent outcome examination)
Humanities (one course-equivalent outcome examination)

Specific Applications of General Skills to Electronic Technology Settings
Electronics-Related Applied Quantitative Reasoning Skills
Electronics-Related Applied Communication Skills
Electronics-Related Applied Science and Technology Knowledge and Skills
Electronics-Related Basic Manufacturing and Workplace Knowledge and Skills

Electronics Job-Related Competencies and Skills
Basic Knowledge of Electronics and Circuits
Basic Electronics Skills
System-Level Setup, Testing and Evaluation Skills

Associate of Arts Degree
(transferable degree)

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[1] Material copied with permission of Alec Testa, Western Governors University.

Exhibit 1.—Structures of WGU Associate of Applied Science in Electronic Manufacturing Technology and Associate of Arts Degrees[1] (continued)

Mathematics and Quantitative Skills
Numeric and Calculation Skills
Functions and Algebra Skills
Geometry and Measurement Skills
Collegiate Statistical/Probability Skills Quantitative Problem-Solving Skills
Quantitative Communication Skills
Quantitative Technological Skills

Language and Communication Skills
Collegiate Reading Skills
Foundational Writing Skills
Critical and Analytical Writing Skills
Presentation-Related Skills
Interpersonal Communication Skills
Basic Information Retrieval Skills

Basic Work-Related Skills
Basic Observational Skills
Learning from Role Models
Monitoring and Evaluating Own Performance
Personal Professional Qualities
Completion of Tasks/Assignments to Client or Supervisor Specifications
Tools and Techniques for Working with Others
Personal and Organizational Responsibility and Ethics
Learning Skills

Collegiate Academic Skills
Organization Strategies
Study Skills
Active Learning Skills
Academic Advising
Academic Integrity
Stress and Procrastination Management

Distribution Domain
Fine and Performing Arts (one course-equivalent outcome examination)
Natural Sciences (two course-equivalent outcome examinations)
Social Sciences (two course-equivalent outcome examinations)
Humanities (two course-equivalent outcome examinations)
History (one course-equivalent outcome examination)

Collegiate Reasoning and Problem-Solving Skills
Problem Identification and Clarification
Identification and Clarification of Stated and Unstated Assumptions
Analytical Planning and Information-Gathering
Interpretation and Analysis of Information/Data
Drawing and Presenting Conclusions
Communication and Language Skills and Mathematics and Quantitative Skills
Cross-Disciplinary Issues and Themes

[To see all WGU degree structures and details, go to the WGU Web Site at www.wgu.edu/wgu/index.html]

[1] Material copied with permission of Alec Testa, Western Governors University.

that can be amended). Note that the learning opportunities that a WGU student uses to learn a skill or knowledge area may not be traditional college courses. Alternatives include, but are not limited to, doing library work, asking to be assigned to particular tasks at their jobs in order to learn new skills, or taking a seminar on the subject. In short, WGU is not concerned with where students learn something (although a "record of enrollment" is maintained for students taking college courses at other institutions, see the discussion below about transcripts and records of enrollment); what matters to WGU is whether and how well a student knows something. A student's knowledge and skill level are demonstrated via achievement on assessments. Once a student feels confident and prepared, s/he takes the assessment battery required for a particular domain. (See assessment discussion below.)

To determine which competencies should be included in a particular degree, WGU uses a rigorous process. Staff consult with individuals working in the particular subject matter area from both academe and industry as well as with experts from professional societies and accrediting associations. They also gather existing competency statements from a variety of sources including the National Skills Standards Board, the Secretary's Commission on Achieving Necessary Skills, the New Standards for Learning Project, ACT's Work Keys project, course syllabi, traditional credit-based program requirements, and professional licensing organizations. In addition, confidential internal corporate documents are sometimes provided by working group members to help guide structures. Using techniques similar to conducting a job analysis in a corporate setting, an initial version of the program structure including explication of the certificates and degree as well as the domains and the competencies that are appropriate for each domain are created from these sources.

The structures of the WGU Associate of Applied Science in Electronic Manufacturing Technology and the Associate of Arts degrees are given in exhibit 1. As shown, the AAS degree is made up of six domains that each have from three to nine subdomains. Six different domains comprise the AA degree. In these two degrees there are domains of three types. The first type is shared by both degrees (Basic Work-Related Skills). The second type has subdomains that are shared by another different domain. For example, the AA Mathematics and Quantitative Skills domain contains many of the same subdomains and individual performance descriptions that make up the AAS Applied Quantitative Reasoning Skills domain. Similarly, the AA Language and Communications Skills domain contains much of the Applied Language and Literacy domain from the AAS degree. The third type of domain is unique to the particular credential such as the Electronics Job-Related Competencies and Skills domain in the AAS degree and the Collegiate Reasoning and Problem-Solving Skills domain in the transferable AA degree. Attachments F-1 and F-2 contain example performance descriptions for the Applied Language and Literacy Skills domain and for the Language and Communication Skills domain. To be awarded a degree, a student in the AAS degree program would need to take six assessment batteries corresponding to each of the six domains required for the degree.

In addition to pursuing a nontraditional method for awarding credentials, WGU has taken a unique approach to faculty roles. WGU "unbundles" the various activities in which faculty members at traditional institutions participate into three primary functions: curriculum development, assessment of student progress, and advising. At WGU, Program Councils, the Assessment Council, and Advisor-Mentors, respectively, carry out these duties. Curriculum development—determination and creation of the competencies—is the responsibility of Program Councils that are composed of academic and corporate subject matter experts who oversee clusters of credentials in specific areas (for instance, the Information Technology Program Council oversees all credentials in the IT area including the Network Administration and the Software Application Analysis and Integration Associate of Applied Science degrees). These

individuals are employed outside of WGU and are part-time, paid consultants to WGU, which allows them to bring an external perspective to the building of degree programs. Student assessment is the purview of the WGU Assessment Council, a paid consultant committee of nationally recognized experts in the field of assessment. The Assessment Council is charged with overseeing the technical aspects of WGU assessment. The final faculty role that has been unbundled is that of Advisor-Mentor. These individuals, the primary links between WGU and its students, are full-time employees of WGU. As mentioned above, their purpose is to advise students of their options and the variety of methods for developing competence. WGU offers no instruction and, therefore, employs no teaching faculty. This faculty function, so central in postsecondary institutions, is fulfilled via instructors in brokered learning opportunities.

Responsibility for clusters of WGU degrees lies with WGU Program Councils. Approximately nine individuals from collegiate and industrial settings who are subject matter experts sit on each Program Council. They give feedback on the staff-prepared degree structures and competencies, give suggestions for people to whom one can send the draft structure and competencies for additional, broader input, and work with the WGU Assessment Council to choose appropriate assessments. Program Council members meet a number of times a year, refining degrees with respect to the level and extent of the competencies and what the learner is required to know upon graduation. They are ultimately responsible for the content of the degrees and for the quality of the students who graduate from the program. Program Councils are equivalent to departmental faculty overseeing a traditional credit-based credential.

To keep the competencies and program structures up to date, the WGU Coordinating Council (composed of Program, Assessment, and Education Provider Review Council members and administrative staff) has set up a regular program review calendar. Additionally, if the members of any Program Council feel that changes are warranted in a credential before the actual program review date, then they may also initiate an update. As each degree structure and its accompanying competencies are agreed upon and added to the WGU catalog, they are given a "version number." When credential structures are updated, they are assigned a new version number. Students are required to fulfill the requirements of the version of a degree in effect when they were admitted. If a student has not yet taken a particular assessment and a domain has been updated to a newer version, the student may be counseled by his or her Advisor-Mentor that taking the newer version would likely enhance job placement. If, however, a student had already passed the assessment before a new version was released, the student does not have to go back and take anything new.

Assessment Strategies

Although the degree-construction process requires a component analysis of what a graduate must do, individual competencies do not constitute the final result. Award of a credential is based on a student's ability to integrate and synthesize the competencies when assessed. At WGU, competencies do not stand alone; they guide assessment of student ability. Competencies and assessments are therefore fundamentally linked.

Responsibility for assessment lies with the WGU Assessment Council and the Director of Assessment. They oversee assessment policy including guidelines for the delivery of assessments and determination of the technical aspects of WGU-sanctioned assessments. Because of the importance of integrating the competencies during assessment, an "assessment battery," a collection of assessment instruments and types, rather than a single assessment instrument, is often used to assess a domain WGU uses a variety of assessment instruments, including those developed by third parties as well as customized assessments built to WGU specifications.

When evaluating the assessment options for a particular domain, the WGU Director of Assessment and the Assessment Council use several pieces of information. They use charts indicating the importance of the various performance descriptions. The appropriate Program Council gives a "rating" to each of the competencies for a credential. On a scale of 1 to 3, the Program Council members indicate how important the competency is—critical importance, high importance, or low importance. This information is used by the Assessment Council to know which competencies must be included in the assessment, because not all competencies are necessarily specifically assessed. There are drawbacks to this approach, but as one member of the Assessment Council said, "WGU may only be measuring criteria imperfectly but it will not be granting degrees based on the precise measurement of irrelevant competencies." Based on Program Council input, WGU assessment staff also prepare a "coverage" chart crosswalking the performance descriptions with available instruments that show how much of the domain is covered by available instruments. Existing published assessments are drawn from Test in Print, Mental Measurement Yearbook, etc. The appropriate Program Council guides the Assessment Council in term of what methods they envision for assessment of various performance descriptions. Finally, the Assessment Council reviews the entire history of the instrument provided by the test maker from a reliability and validity standpoint. The Assessment Council then makes determinations about the technical properties of the instrument itself. All of this information is used by the Assessment Council to make decisions on the use of existing instruments for assessing particular domains.

If the Assessment Council and Program Council find that no instrument adequately addresses the domain, they contract out for the creation of new assessment instruments. The more unusual domains that require performance tasks in the assessments, such as electronic manufacturing technology, have been contracted. WGU is using accepted professional practice for establishing the validity and reliability of these new WGU instruments. Standard American English is used, and content sensitivity is conducted to eliminate bias. An expert reviews the draft instrument and writes a technical critique of it; changes are made accordingly. A pilot test is then conducted either in a classroom setting or in a workforce setting using at least 50 people, preferably more if possible. Item analysis, including calculation of item difficulty, item/total score correlation, internal consistency measures, item means and variances, total and subscore means and variances, and item frequency distributions, is done. There are additional revisions based on the results of the pilot test and item analysis. Ongoing checks of reliability and validity are scheduled. This process is used for portfolios, scoring rubrics, performance assessments, etc.

When all these data are accumulated, several principles guide the Assessment Council as they make their decisions. First, each assessment battery must include some authentic performance tasks. Second, different contextual manifestations of the ability must be defined. And third, an attempt is made to include different instrument types in the mix constituting the assessment battery for a particular domain.

Based on the data collected and using these principles, the Assessment Council arrives at the established assessment battery to be used for each domain. The WGU-acceptable "cut score" for competence on any domain is determined using existing information. This information includes American Council on Education recommendations for assessments that are already in commercial use, cut scores used by other educational and professional groups, as well as those cut scores recommended by the test's publisher. The question of how many distinctions within "competent" are appropriate has also been debated at length. Some people argue that it is an either-or scenario—either a student is competent or he or she is not. The prevailing view among Assessment Council members is that in addition to a minimal cut score reflecting a student's adequacy in a particular domain, there should also be a higher score that distinguishes "mastery."

Thus, for most instruments, two distinct cut scores are used to reflect competent and mastery performance. Again, instruments developed for WGU use standard statistical testing and norming procedures to determine these cut scores. Attachment F-1 contains a description of the assessment battery for the Applied Language and Literacy Skills domain from the AAS degree, and attachment F-2 contains a description of the assessment battery for the Collegiate Language and Communication Skills domain that is part of the Associate of Arts degree.

Early in the development of WGU, the program councils and the Assessment Council made a distinction between those domains that focused on identifiable knowledge and skills and those that are attitudes and dispositions. The first are awarded "certificates of mastery" and the second are awarded "certificates of completion." There is only one domain to date that awards a "certificate of completion" at this time, that is Basic Work-Related Skills. This difference is an acknowledgment that attitude and dispositions are of a different order that other knowledge and skills. WGU recognizes these abilities and believes it can sensitize students to socially acceptable behavior, but WGU cannot certify that a student always uses these abilities or acts in a sensitive manner. Descriptions of the assessment battery for the Applied Language and Literacy Skills domain, the Collegiate Reasoning and Problem-Solving Skills domain, and Basic Work-Related Skills domain are included in attachments F-3, F-4, and F-5, respectively.

The reliability and validity of the individual assessment instruments that make up the assessment batteries are gathered from the test publishers for existing instruments or are generated in the building of WGU-specified instruments. In addition to the Assessment Council reviewing this information, the program review process conducted by the WGU Coordinating Council also includes consideration of these data in the light of student performance on assessments. A method of tracking student performance in the future and asking employers about their abilities is planned. Due to limited WGU enrollment at this time, only limited data are available. Data are being captured for reliability and validity analyses to be conducted in the future when statistical robustness can be ensured.

It is too early to tell if WGU competencies are valid. Whether or not the competencies are "the right ones," only the market will tell, and again no data are currently available. However, to this end, steps have been taken in the development of the competencies to have subject matter experts from a variety of situations ratify them up front. Job placement and job success statistics for WGU students will be necessary to make decisions on whether the competencies are "correct."

Procedures for Documenting Student Learning

Western Governors University keeps both transcripts and records of enrollment. Transcripts are official documents maintained only for degree-seeking students; they include lists of the assessments required for the students' competency-based degree programs, scores for assessments and portfolio(s) passed, as well as completion dates for credentials. Assessment scores do not expire, but employers and other postsecondary institutions can see how much time has elapsed since completion. A Record of Enrollment is maintained for all students who enroll for learning opportunities through WGU. This record includes the name of the learning opportunity, education provider, and learning outcome or grade. Records of Enrollment are kept for the convenience of students and are not official grade transcripts; students must get those directly from the education providers. As might be expected at a "virtual" university, most of this information is kept electronically in a form that can be printed in hard copy as necessary.

Because of the unique degree structure at WGU, academic administrators knew that transportability was a key issue. With regard to the transfer of WGU work and credentials to other institutions, several articulation agreements have been signed or are in the works with individual institutions (to date, Jones International University, Washington State University, Regents College, Empire State College, and University of Iowa). Some of these allow transfer and articulation of the Associate of Arts degree that was designed to be the first 2 years of a liberal arts and sciences baccalaureate degree (such as the transferable AA degree articulating with Jones International University's Bachelor of Arts degree). More states and institutions are starting to look at WGU degrees, domains, and competencies with regard to transfer and articulation. WGU also articulates with its partner institution, the Open University UK. In addition, WGU officials are talking with Utah and Oklahoma to have blanket articulation agreements with all public institutions in those states. With regard to the transfer of credit achieved at other institutions into WGU, students need only pass the assessment to demonstrate their competence. If a student has already passed an assessment elsewhere (as opposed to accumulating credit), then the Assessment Council would be asked to review the assessment instrument that had been taken. No one has exercised this option yet.

Data Ramifications

The change to a competency-based rather than a credit-based degree system has made WGU think how student academic information is captured and organized. Transcripts carry domain titles rather than course names and assessment scores and completion dates in lieu of course grades. Because they started from scratch, there was no need to go back and refashion an existing student information system to include competencies and assessment scores.

In some ways, WGU is better placed to study the reliability and validity of their assessment batteries than many traditional institutions. WGU is structuring their student and academic information systems from the beginning to be able to conduct statistical analyses. Eventually WGU will be able to study patterns of student enrollment in various learning opportunities and how well those students performed on subsequent assessment batteries. This information will be shared with Advisor-Mentors in order to advise students better on useful learning opportunities.

Advantages and Challenges Associated with Competency-Based Educational System

From the beginning, WGU was founded on the concept of competencies. Because they were the basis for the institution, the various degree structures as well as the organizational structures of councils, staff, and their relationships have as their central purpose the delivery of competency-based degrees. In fact, the idea of competency-based education was the reason the traditional roles of faculty and administration were completely unpacked and distributed to various staff positions, faculty councils, and third-party agencies. This organizational structure allows internal checks and balances. Having program councils determine the competencies for a particular program without primary concern about the acquisition of appropriate assessment measures helps ensure academic integrity. Similarly, other postsecondary and corporate providers supply instruction, but competence is determined by a student's subsequent performance on an assessment battery, which provides a check on the quality of instruction. These organizational checks and balances were a natural consequence of the a priori commitment to competency-based education in the development of WGU.

Competencies are the common thread throughout WGU academic offerings. They are the sole basis of any WGU credential. Because credentials have a modular structure based on competencies, there is additional flexibility that allows lower level certifications to build up to full degrees. In addition, the individual competencies or performance descriptions are links to learning opportunities offered by external entities. Education providers who choose to list their learning opportunities through WGU are given the option to "map" these opportunities to the competencies. A course that maps to a WGU competency has that WGU competency as one of its learning outcomes. The Education Provider rates their learning opportunity (course) in the light of the WGU competency using a scale including "P" or 0 through 5. "P" indicates that the competency is a prerequisite for the learning opportunity. If the learning opportunity does not address the competency, it is given a 0. If the learning opportunity does cover the competency, then a determination must be made regarding to what extent the competency is covered, 1 for low coverage and 5 for high coverage. In short, competencies are a primary link throughout the WGU academic infrastructure.

Advantage and Challenge

WGU is a unique entity in the world of nonprofit postsecondary education, which is both a positive and a negative position. Politically it had become apparent to the governors and their staffs that the regulatory-push method was no longer sufficiently radical to induce much change in postsecondary education, so the decision was made to try a market-pull mechanism. The conceptualization of WGU was attractive because it might force existing institutions into doing something different and stir up postsecondary education. Some people object to this characterization; nevertheless, it was the governors' intent. While some people feel that WGU has had no effect on postsecondary education, governors, state higher education executive officers, and presidents of institutions from the western states have noticed changes, particularly among regional state college and university systems. Western Governors University's developers point out that despite the difficulties, their biggest success is that they have been able to get the institution off the ground at all.

A major challenge is that the amount of time involved to create competency-based degrees was initially underestimated. It took approximately 9 to 12 months to develop competencies for each degree, with additional time added to that to determine an appropriate assessment battery. (Several degrees were worked on in parallel.) Efforts were made to try to accelerate this timeline for each degree and its assessments, but doing a thorough and rigorous job, no matter what process was used, took about a year. The competency-based degrees are the heart of the WGU mission, and graduates of the programs will be the standard by which the success or failure of WGU is measured. Because of these consequences, the planning process cannot be given short shrift.

Another difficulty has been explaining the conceptualization of the competency-based degrees to people who have only experienced seat- and credit-based degrees. WGU staff have found that people from outside academe (corporate or business people) tend to understand the system more quickly than those who worked within postsecondary education already. People want to make sense of the unique structures at WGU in terms of what they already know and understand. WGU has responded to this by making analogies between traditional structures, functions, and roles and those at WGU when possible.

Another challenge has been the initial assumption that existing assessments would cover the necessary competencies. Existing assessments cover only a piece of any given domain. The result is that existing assessments must be configured in a patchwork to create the assessment

batteries. Additionally, difficulty arises in the delivery of assessments that come in a variety of formats and styles. A secondary concern here is the legal maneuvering among the various testing and assessment groups, which causes some unique problems when delivering assessments from competing organizations.

WGU found that policies based on traditional seat- and time-based measures had to be updated or eliminated. The tuition payment process is still time-based, as is the residency requirement that is mandated by the federal government—of course, this requirement has little meaning because students are not "in residence" and instruction is not offered directly by WGU. The change to competency measures has meant that WGU had to submit 14 different waivers on their financial aid application.

Another challenge for WGU has been how to bring expectation in line with reality. The unique nature of Western Governors University has made the institution an easy mark for attack. The *Chronicle of Higher Education* has noted the large amount of money from both public (initially) and private coffers that has been necessary to bring WGU to limited functioning at this point. Misinformation has been fueled by the political rhetoric moving ahead of the actual building of the infrastructure. In addition, basic misunderstandings are rife regarding the amount of work necessary to create an institution from the ground up—especially one that is not a part of an existing institution or system. Responding to these critiques, coupled with the imperative that what was being created had to be viable and impeccable, has meant that WGU staff must explain the balance of expectation and reality.

Recommendations for Other Colleges and Universities

Several recommendations emerge from Western Governors University's experiences creating competency-based degrees. Some have to do with the larger issues of what to do when undertaking large-scale change, and others are more specific and have to do with the mechanics of using competencies.

In terms of large-scale change, WGU's experience with misinformation, expectations exceeding reality, and time constraints result in these recommendations. First, interact with as many people as possible to distribute information on 1) what the change is, and 2) why it is being undertaken. This step may seem trivial, but if the change is radical, it will take multiple discussions to sufficiently explain it to others. People who are not involved at the heart of the innovation will have a much harder time and need longer to assimilate the information in terms of how they view the world. They should be given every opportunity to ask questions and have those questions answered. In the building of WGU degrees, questions asked by confused yet interested outsiders helped strengthen many of the degree structures. Despite the staff's best efforts, if the change is a personal favorite or a hot topic, trustees, presidents, and other academic administrators may talk up an innovation before it has had time to sufficiently develop. That happened in the case of WGU with the governors' desire to have the institution functioning almost as soon as they thought of it. To bridle expectations in the light of realities such as time, money, and staffing constraints, one must share as much information as possible without jeopardizing intellectual property.

With regard to using competencies, several recommendations surface. These include 1) do not underestimate the amount of time necessary to do a good job, 2) integrate competencies with credit-based systems, and 3) keep in mind assessments from the beginning. The first of these seems obvious. Unfortunately, many people underestimate what is involved in competency-

based degrees. The faculty overseeing the degree first need to understand competency-based degrees in generally the same way. Then the competencies must be compiled, edited, and agreed upon. The time involved in these activities is enormous and necessary. Faculty overseeing a competency-based degree must understand each competency and why it was included in the degree if they are to be able to create learning opportunities and advise student about the subtleties of the degree. Discussions of competencies lead to further in-depth investigations, particularly among faculty who teach course sequences. Repetitive material is often eliminated from subsequent courses, and course materials are altered in terms of the subject matter included. Faculty must be given the time to do a good job from the beginning. As faculty become accustomed to the process and what is involved in a competency-based degree, the overall timeline may shrink somewhat.

The second recommendation is to integrate competency- and credit-based systems. Since most postsecondary institutions are not like WGU and have credits as their academic currency, they must keep in mind how they will adapt student and academic information systems and policies to allow for both credit and competency attainment. Again, this is not a trivial activity. The student information system needs to be investigated to see if it is capable of integrating additional data stemming from the assessment of competencies. Can currently unused fields be adapted to carry types of assessment, how many attempts at an assessment, scores, subscores if desired, and dates of assessment attempts? In addition, policy decisions about how credits and competencies mix in terms of student progress and other areas must be made. A policy audit searching for places where credits or competencies make a difference should be done.

Finally, the competency-assessment link is critical. The institution must decide if exams and projects created by single faculty members can be used to demonstrate competency or if assessments written by groups of faculty and third-party assessments are to be used. Faculty-written assessments that undergo the same reliability and validity testing as external third-party assessments could be used. However, some faculty might consider this a questioning of their ability or an attack on their academic freedom. On the other hand, viable assessments written by faculty with corresponding reliability and validity data also become financially viable as third-party assessments outside the institution.

Conclusion

Western Governors University was created to be a unique postsecondary institution. Along the way, they have also fashioned a system for creating competency-based degrees that other institutions might want to consider. The jury is still out with regard to how well their system works until more data are gathered on student performance both on the assessments and in later job success. Until then, it remains an institution to watch.

Attachment F-1

Examples of Performance Descriptions
Applied Language and Literacy Skills
Copyright Western Governors University[1]

Applied Language and Literacy Skills Domain

Reading Skills Subdomain (9 performance descriptions)

Examples:

Identify statements or conclusions contained within a written passage or document that contradict or are not supported by evidence contained within that passage or document.

Apply the information presented in a written passage to situations not described or not completely similar to those described in order to reach a workable conclusion or make an appropriate decision.

Demonstrate the ability to form conceptual images or models from written material that contains descriptions of objects or actions.

Writing/Information-Recording Subdomain (14 performance descriptions)

Examples:

Produce written communications that convey information containing several distinct points clearly, logically, and without ambiguity.

Produce written communications that keep to a main point and avoid unnecessary information.

Use a computer word processing program to generate and revise text, including using basic keyboarding skills to enter text and numerical information.

Presentation-Related Skills Subdomain (12 performance descriptions)

Examples:

Speak clearly and audibly with a minimum of distractions.

Select and use appropriate media for presentation to a given audience.

Adjust style, tone, length, and level of detail presented in an oral presentation to suit the needs, experiences, and cultural sensitivities of a particular audience.

[1] Material copied with permission of Alec Testa, Western Governors University.

Interpersonal Communications Skills Subdomain (13 performance descriptions)

Examples:

Identify changes in tone or emphasis in communications (particularly oral and electronic) that result from contextual or cultural differences that amplify meaning beyond the message presented.

Avoid drawing conclusions prematurely before listening to or reading an entire message or communication.

Formulate and ask appropriate questions to clarify points of information or opinion.

Basic Information Retrieval Skills Subdomain (18 performance descriptions)

Examples:

Recognize the variety of approaches to referencing and attribution and their uses, such as citations, footnotes, annotations, etc.

Recognize the varying reliability of sources of information including problems of logic, factuality and authority in relation to a given subject or question.

Use two or more different kinds of documents or displays (e.g., data tables, graphic displays, indexed lists of procedures, gauges, and dials) to obtain the answer to a posed problem that requires the combined use of several sources.

Attachment F-2

Examples of Performance Descriptions
Collegiate Language and Communication Skills
Copyright Western Governors University[2]

Collegiate Language and Communication Skills Domain

Collegiate Reading Skills Subdomain (19 performance descriptions)

Examples:

Identify and describe the specific writing strategies and techniques employed by an author in a written passage or text--such as voice, irony, sentence structure, use of supporting examples and evidence, use of analogy or verbal imagery, or other stylistic features--and evaluate their effectiveness.

Demonstrate recognition of other voices and/or points of view incorporated into text by its author(s).

Prepare an annotated bibliography outlining the subject matter and arguments of a number of texts related to a particular topic or theme.

Descriptive Writing Subdomain (15 performance descriptions)

Examples:

Produce written communications that convey information containing several distinct points clearly, logically, and without ambiguity.

Articulate a process for generating ideas, drafting, and revising written communications.

Make use of a broad and varied vocabulary in writing and be able to identify or select alternative words to convey equivalent meaning.

Critical and Analytical Writing Skills Subdomain (7 performance descriptions)

Examples:

Produce written communications that engage a reader by establishing a context, voice, or point of view for the author or that otherwise develop and sustain reader interest.

Produce a sustained piece of writing intended for a specific audience that analyzes a complex idea or posed position from several points of view, compares it to other similar positions or arguments, supports it with appropriate examples and references, contrasts it to other contradictory positions or arguments, and states a clear conclusion.

Produce a written analysis of the strengths and weaknesses of a piece of one's own writing by explaining what writing strategies were used, why specific arguments were presented as they were, and how the piece might be altered for a different audience.

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[2] Material copied with permission of Alec Testa, Western Governors University.

Presentation-Related Skills Subdomain (12 performance descriptions)

[Same as in the Applied Language and Literacy Skills domain.]

Interpersonal Communications Skills Subdomain (13 performance descriptions)

[Same as in the Applied Language and Literacy Skills domain.]

Basic Information Retrieval Skills Subdomain (18 performance descriptions)

[Same as in the Applied Language and Literacy Skills domain.]

Attachment F-3

Description of Assessment Battery
Applied Language and Literacy Skills Domain[3]
(Excerpted from document supplied by Western Governors University)

Requirements for this domain assessment battery include WGU approved assessment activities in reading, listening and writing, locating information, English composition, and a performance task. The reading exam is a thirty-six-item multiple-choice exam that requires forty minutes to be administered. Students review several passages prior to responding to questions. The exam is normed for college students at the freshmen and junior level.

The listening and writing exam is made up of multiple-choice and open response questions. The assessment takes forty minutes to complete. Students listen to an audiotape and then respond to questions. The exam is normed for adults, and the level of competence mastered by students is above the 90th percentile. The locating information exam is made up of thirty-eight multiple-choice questions, and takes forty-five minutes to administer. The exam is normed for adults, and the level of competence mastered by students is above the 90th percentile.

The English composition exam is comprised of a fifty-five-question multiple-choice component and one written essay question. The multiple section and the essay section each take forty-five minutes to administer. The exam is normed for college students, and the level of competence required by WGU students meets the recommendations of the American Council of Education.

The performance task was developed by WGU to measure competence in areas not covered by commercially available tests. It covers primarily research and presentation skills.

[3] Material copied with permission of Alec Testa, Western Governors University.

Attachment F-4

Description of Assessment Battery
Collegiate Reasoning and Problem-Solving Skills Domain[4]
(excerpted from document supplied by Western Governors University)

This domain assessment battery is made up of a nationally normed critical thinking examination and a WGU-produced series of professional problem-solving activities. The nationally normed exam requires short answers and is administered in three parts. The WGU developed activity is designed to be conducted with support from the Advisor-Mentor and is a written activity.

[4] Material copied with permission of Alec Testa, Western Governors University.

Attachment F-5

Description of Assessment Battery
Basic Work-Related Skills Domain[5]
(excerpted from document supplied by Western Governors University)

Assessment in this area is formative and not summative. The WGU Program Council intended to ensure that students had skills in Basic Observational Skills, Learning from Role Models, Monitoring and Evaluating Own Performance, Personal Professional Qualities, Completion of Tasks/Assignments to Client or Supervisor Specifications, Tools and Techniques for Working with Others, Personal and Organizational Responsibility and Ethics, and Learning Skills. Students complete a number of identified assessment activities. The domain assessment battery is evaluated for completeness, and the results are shared with the Advisor-Mentor to help inform and enrich the advising/mentoring relationship.

[5] Material copied with permission of Alec Testa, Western Governors University.

APPENDIX G

Proficiency-Based Admission Standards System (Oregon)

Introduction

This case study focuses on the Proficiency-based Admission Standards System (PASS) in the state of Oregon. Their system is one of the more elaborate systems for proficiency-based admission in the country and has been in existence long enough to be grappling with how to express and share competencies. This latter characteristic was important for studying possible data ramifications. In addition, successes and challenges will be highlighted, although the project is as yet in its early stages. A more critical perspective will be possible after the new PASS system has been used as admissions criteria for several entering classes of students.

Competency-Based Admissions

A 1997 survey conducted by the State Higher Education Executive Officers (SHEEO) organization identified 11 states (approximately 20 percent of the nation) contemplating or instituting competency-based admission systems (Russell, 1998). Many of these states (California, Georgia, Iowa, Kansas, Minnesota, and New York) are only in the embryonic stages of development, gathering preliminary information for review. Of the five remaining states, Colorado and Wisconsin are focusing their efforts on creating dual admission systems—using competencies alongside the existing traditional admissions criteria. Wisconsin is further along in its development currently investigating the effects of their dual system on the various groups of students who have been admitted by the two systems (University of Wisconsin System, n.d.). Finally, three states—Maryland, Oregon, and Washington—are planning eventually to have a single state system for college admission based solely on competencies. Maryland's reason for doing so is to ease transitions in the K-16 continuum. The impetus for adopting competency-based admissions systems in Oregon and Washington is to build on and integrate with K-12 systems that are increasingly competency-driven.

Site Visit

The PASS offices are located on the campus of the University of Oregon in Eugene. Five people were interviewed in person or via telephone. Additional information and reading materials were gathered both in person, from the Web, and in subsequent telephone conversations. Interviews were conducted with three staff members—the Executive Director, the Assessment Director, and the Evaluator—and two people external to the project but well acquainted with it—a former university admissions director and an administrator from the Oregon University System. Three individuals were advocates of the new system, while the other two had reservations about PASS. Interviews focused primarily on the consequences this project would have within the postsecondary sector and how it would effect the use of data as it applies to issues of reliability, validity, and transportability.

History

The origins of PASS begin in 1991 with Oregon's K-12 reform efforts. In 1991 and 1995, the legislature adopted the use of the Certificate of Initial Mastery (CIM) at the 10th grade level and the Certificate of Advanced Mastery (CAM) at the 12th grade level. The CIM and CAM both focus on competencies or "proficiencies" necessary for student achievement. CIM requires academic achievement in English, math, science, social sciences, arts, and a second language. CAM requires achievement in the same academic areas plus generic career-oriented competencies in "personal management, problem solving, teamwork, communication, workplace systems, career development and employment foundations" as well as application of academic knowledge in a work context (Oregon Department of Education, n.d.). In response to these changes at the secondary level, the Oregon University System (OUS) in 1994 adopted a proficiency-based method for admission to colleges and universities in its system; note that there are no statutory requirements for PASS. PASS is to be phased in over a number of years with full implementation expected with the entering class of 2005.

The PASS Project

OUS chose to go to a proficiency-based system "to increase the likelihood that students who are admitted to college will be able to succeed and to graduate in a timely fashion" (PASS handout, "Overview of Changes in Oregon University System College Admissions Expectations," April 1999). PASS is focused exclusively on academic subjects and whether a student is prepared for academic work in higher education; it is not about workplace or employment competencies. PASS advocates point out that another reason for moving to proficiency (and competency-based) models is the current dissatisfaction with the reliability of grade point averages as proxies for student learning; they believe that in the long run, proficiencies will be better measures. In addition, administrators would like to use PASS proficiencies and scoring in placement decisions as well. Finally, another suggested future outcome of PASS is that the Associate of Arts Oregon Transfer (AAOT) degree will eventually be defined by proficiencies rather than the credits now used, removing obstacles to seamless transitions along the path to a baccalaureate degree.

When fully implemented, PASS will require students to demonstrate proficiency in six subject areas—math, English, social science, science, visual and performing arts, and second languages. For each of these subject areas there are 4 to 7 individual proficiencies for a grand total of 33 proficiencies (plus 1 recommended proficiency). PASS proficiencies are "what it is we want students to know and be able to do; there is both a content piece plus an intellectual process side to the proficiencies" (interviewee quote). One positive outcome of this explicit stating of proficiency criteria is that high school students appreciate knowing exactly what is expected of them (PASS, n.d.). The proficiencies are being phased in as admission requirements over 4 years. English and math will be required in 2001, science is added in 2002, social science in 2003, visual and performing arts in 2004, with second languages being the last added as a requirement in 2005. Once PASS is fully implemented in 2005, the old admission system will effectively be phased out. (See the complete list of proficiencies at the end of this document.)

Concerns of parents, students, and admission officers center on transfer and articulation across postsecondary systems. These have been addressed by working with major out-of-state institutional receivers and providers of students. Agreements in principle have been reached with the University of California and California State University systems, the University of Washington, and private universities such as Stanford have provided letters of support to PASS. Additional concerns center on the award of financial aid and scholarship monies that are based on

grade point averages and credits and NCAA requirements. Steps are being taken to address these issues.

Proficiency Assessment and Scoring

Each of the 33 PASS proficiencies is "scored" into one of the following categories:

- No evidence of proficiency;
- Working toward proficiency (evidence collected indicates that the proficiency has been attempted but does not indicate proficiency);
- Partial proficiency (a student's collection or test score suggests proficiency but is not enough to convince there is proficiency);
- Proficient;
- Highly proficient (more and better at doing the proficiencies than required); and
- Exemplary or unique proficiency (work exemplifies the proficiency, or is so unique it needs to be recognized by university admissions whether it meets the proficiency or not).

Students may present assessment tasks, collections of evidence, or a combination of assessment tasks and collections to establish their levels of achievement for the proficiencies. Acceptable assessments include state multiple-choice tests (which include national examinations such as AP, CLEP, ACT, and SAT II) or state on-demand assessment tasks that require response to an open-ended question that is then distributed to graders. Alternatively, students may achieve proficiency using academic work collections. Student work collections are "scored" by the students' teachers in lieu of high school grades. This mechanism allows teachers to incorporate the scoring of proficiencies into their existing grading process and will one day replace the traditional grading process. Because of this substitution, there are no additional costs to pay scorers and the scoring workload is distributed across secondary school teachers. Some schools and districts may one day investigate doing scoring collectively, but that decision is internal to the individual school or district and in the future.

Teachers initially judge student collections of work on two properties. First, is the collection *sufficient,* and second, is it *proficient.* "Sufficiency" in this context means that the collection represents the student's performances and "adequately represents the proficiency [to be demonstrated] and creates a fair opportunity for the student to demonstrate his or her knowledge and skills through a variety of tasks" (PASS Notes, May/June 1999, p.2). One respondent used the legal analogy, "is there enough evidence to indict?"

"Proficiency" in this context means that the collection is indicative of the student's mastery of the necessary knowledge and skills. Each piece contained in the collection is rated. Note, the number of pieces in a collection can vary, and the collection is not supposed to contain enough pieces to allow a one-to-one check-off of the proficiencies because proficiencies, like competencies, are not enacted in isolation but are integrated in the work. Students choose, in consultation with their teachers, what to include in the collection. This allows students the freedom to "put together lots of different combinations of evidence—this is one indication of the flexibility in the system" according to of one respondent. Finally, the teacher (or teachers) who is

judging the collection categorizes the student work collection for each proficiency for which it was submitted.

High school teachers are provided with criteria and guidelines and are invited to "scoring events" and "verification institutes" in order to learn how to score and judge collections and then verify one another's judgments. These institutes are sponsored and paid for by PASS using grant money. The need for these institutes will diminish as exemplars and scoring guides are created and teachers become comfortable with the meaning of "proficient" in many settings. Criteria for each of the proficiencies have been published and guide the work of teachers as they categorize student work collections. An example of a criterion for the English proficiency "interpret literary works" is "interpretation and use of textual evidence," described as "students demonstrate the ability to use textual evidence to develop and support an interpretation of a literary work" (example from http://pass-ous.uoregon.edu/standards/english/eng_summary.html). "Calibration institutes" are also being held with university faculty to allow them to understand the scoring and verification procedures and see examples of high school student work for themselves.

In the early stages of the system, cut scores are based on empirical studies and advice given to the PASS staff. These initial cut scores will be used to establish a baseline that will then be adjusted based on validity studies and studies to determine the predictiveness of the scores. Cut scores are set for the entire Oregon University System, in part because the philosophy of PASS is that as a state system a certain level of achievement is required of students, and if students achieve at that level of proficiency then they are capable of doing well at any university in the system. Each university, or major, is free to establish more stringent proficiency cut scores, but OUS will have only one. It is hoped that by focusing on setting a single standard for student performance, (1) the extraneous information that filters in with grades will be eliminated, and (2) the process will be less competitive.

There are no student portfolios nor are student work collections forwarded to universities. Instead, PASS has created a "proficiency transcript" (see example in attachment G-1), which university admissions offices can use quickly and at a glance. Each subject area lists the number of proficiencies with space for the proficiency score, the assessment method used, and the date the assessment was verified. In addition, the transcript has space for recording the dates CIM proficiencies were awarded.

Work has just been completed bringing the CIM, CAM, and PASS proficiencies into alignment. Designed for different functions—CIM and CAM are proficiencies for "getting out" of high school and PASS proficiencies are for "getting into" college—they are nevertheless linked. While not a linear progression, both CIM and CAM contain proficiencies that will fulfill PASS needs.

Innovative methods for college admission must be rigorous with regard to the reliability and validity of the measures and processes used, and steps are being taken to fulfill this need. Multiple measures are available for determining proficiency, cross-scoring of student collections occurs by multiple teachers, and researchers gather data on pilot students and from early scoring and verification events to study the predictive validity of the proficiency scores given to students. One day these predictive validity studies will yield information useful to students who have taken time off between high school and college as they choose the best courses to take as they re-enter their academic studies. In addition, an American hybrid of "moderation panels" used in Australia will be looking for systematic over- and under-rating by teachers and will make adjustments accordingly. The PASS Assessment Coordinator is planning to investigate patterns of scoring for teachers used as raters and for groups of teachers.

Policy Issues

Oregon has some remaining policy issues to be confronted in the next few years, including agreeing on levels of achievement for exhibited proficiency that reflect desired incoming freshman ability levels. They know also that once these standards are in place, there must be support systems created for students who fail to achieve proficiency. In addition, OUS and its institutions should be prepared for any decreases in funding that might occur if a substantial portion of students do not exhibit proficiency and their subsequent entering enrollments decline. However, Oregon's enrollment-driven funding formula is constructed such that retaining more students, even if enrollments do decrease, could result in a funding increase.

Successes and Challenges

At this point in the development of PASS, it is easier to see the challenges that still must be faced than to identify the successes. Successes are clearer after a project has been given time to be implemented and mature. Nevertheless, initial successes might include the administrative acceptance of a proficiency-based system and the seeming acceptance by faculty. In addition, PASS has been given ample development time. This characteristic is critical to decisionmaking. Because PASS was not created in response to a crisis, adequate time has been allowed for reasoned decisions to be made. Another success is that high school students and teachers like the explicit nature of the proficiencies and knowing what is required of them (PASS, n.d.). Finally, the efforts to ensure articulation with university systems outside OUS and the state have been impressive.

With regard to challenges, many already exist, and in the coming months others will emerge during implementation. The relative silence of faculty with regard to proficiencies now might not be tacit approval, it may just mean that proficiencies have not yet directly affected faculty work. Their buy-in is critical to the success of the project. One difficulty has already become apparent in the different standards that groups of faculty apply to the various proficiency areas—math faculty think that a more advanced level of math is required, while natural sciences faculty think that a more moderate level of math understanding is enough. Another challenge and perhaps misstep taken by the PASS coordinators is the tepid involvement of sitting admission directors. Some of them feel that their concerns regarding NCAA requirements for scholar-athletes and financial aid have not been adequately addressed. In practice, these issues will need to be quickly resolved to avoid penalizing students as the system becomes functional. Finally, as with any proficiency or competency-based system, the proof will be in the assessment of the proficiencies, the consistency with which they are judged, and how students admitted using the new method fare within the Oregon University System.

Conclusion

The PASS system is an example of the use of competencies—proficiencies—for the transition from secondary school to universities. A great deal of thought has gone into determining how the system will work. PASS's progress and data reports will need to be monitored as the system is phased in to see how they are faring with regard to acceptance of and student success under the new system.

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Attachment G-1

PASS PROFICIENCIES[1]

(Adapted from *Proficiency Standards: Summary Charts of Criteria for All Content Areas, 1998-99*, PASS, Oregon University System, Office of the Chancellor, Eugene, OR)

English Proficiency Areas

Read From a Variety of Literary Genres And Periods

Read and respond to a broad selection of literature from a variety of historical periods, cultures, literary perspectives, and genres, including poetry, novels, short stories, essays and drama; understand the characteristics of literary genres, periods, and movements.

Interpret Literary Works

Analyze literary forms, elements, devices, and themes to interpret and critique literary texts, performances, and media.

Analyze Relationships of the Humanities and Human/Social Experience

Explain how the humanities reflect, influence, and comment upon human experiences and societal assumptions, traditions, structures, and changes.

Conduct Inquiry and Research

Conduct inquiry and research, using a variety of primary and secondary sources and informational resources to investigate questions and topics, gather and synthesize information, and create and communicate knowledge.

Communicate in Oral, Visual and Written Forms

Use oral, visual, written and multi-media communication forms to convey information and ideas for a variety of purposes, audiences, and contexts.

Write for Varied Purposes

Write to discover and convey meaning, using effective processes to produce writing that is thoughtful, fluent, organized, coherent, and clear.

Math Proficiency Areas

Perform Algebraic Operations

Use algebraic operations and mathematical expressions to solve equations and inequalities including, but not limited to, exponentials and logarithms.

Use Functions to Understand Mathematical Relationships

Use patterns and functions to represent relationships between variables and to solve problems; interpret and understand the connections among symbolic, graphic, and tabular representations of functions.

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[1] Material copied with permission of Christine Tell, Oregon University System. PASS standards are updated annually. See PASS Web Site: http://www.ous.edu/pass/

Use Geometric Concepts and Models

Represent and solve problems with two- and three-dimensional geometric models, properties of figures, analytic geometry, and trigonometry.

Use Probability and Statistics to Collect and Study Data

Use probability and statistics in the study of various disciplines, situations, and problems; understand and apply valid statistical methods and measures of central tendency, variability, and correlation in the collection, organization, analysis, and interpretation of data.

Estimate and Compute

Use computation, estimation, and mathematical properties to solve problems; use estimation to check the reasonableness of results, including those obtained by technology.

Solve Mathematical Problems

Apply mathematical problem-solving strategies to problems from within and outside mathematics; devise, implement, evaluate, and communicate processes and solutions; select and use appropriate models, operations, and technologies.

Reason Mathematically

Formulate and test mathematical conjectures (i.e., make generalizations from observations); draw logical conclusions from given or known information; follow and judge the validity of mathematical arguments and proofs.

Science Proficiency Areas

Know Fundamental Concepts of the Sciences

Know and apply fundamental and unifying concepts from the physical, life, and Earth and space sciences, demonstrating general scientific literacy.

Understand, Use, and Investigate a Domain of the Sciences

Understand, use, and investigate essential concepts, principles, theories, relationships, and experimental processes in a domain of the sciences, exhibiting a specialized scientific competency.

Analyze Scientific Knowledge, Theories, and Research

Analyze and evaluate scientific information and claims to understand the nature of scientific knowledge, the context in which scientific theories and concepts develop, and the implications of scientific research for society.

Design and Conduct Scientific Investigations

Design and conduct experiments using principles of scientific inquiry, investigative processes of the sciences, scientific instruments and technology. Collect and analyze data, critique experimental designs, and communicate scientific problems, results, and arguments.

Social Science Proficiency Areas

Know and Use Geographic Information

Know and use geographic information, concepts, and skills to understand and analyze historical, social, economic, political, cultural, and environmental issues.

Understand Patters of Human History

Exhibit knowledge of the chronological flow of human history; identify major themes of historical change in prehistoric through contemporary periods.

Understand United States History

Understand significant eras, concepts, people, events, and relationships in U.S. history. Employ historical thinking and inquiry to understand events, issues, developments, relationships, and perspectives of history, and to interpret current trends and issues.

Understand Structures and Systems of United States Government

Understand the principles, purposes, structures, and functions of government in the United States: its philosophical basis and historical evolution; the structure of power, authority, and governance; the relationship of the states to the federal government; the Constitution and Bill of Rights; the dynamics of conflicting rights and interests in the American political system; the role and responsibilities of citizenship; and patterns of democratic participation in American politics. Compare other forms of government and political systems to those found in the United States.

Analyze Economic Systems

Analyze the structure and functioning of economic systems, their relationship to national and international political, social and geographic systems, and the conditions that influence the development of such systems.

Conduct Social Science Analysis

Research and analyze complex societal issues, phenomena, and events, posing and communicating potential responses. Use the varied perspectives of the social sciences, varied data sources, and technology in social science inquiry and analysis.

(Encouraged) Examine Aspects of Human Behavior

Examine dimensions of individual and group behavior and the effects of culture and ethnic diversity within and among societies, using information from the behavioral and social sciences.

Visual and Performing Arts

Understand Elements, Principles, and Processes in the Arts

Understand the ways in which artists use elements, materials, technologies, artistic processes and organizational principles in similar and distinctive ways in various art forms and disciplines.

Understand the Role of the Arts in Society

Understand the role the arts play in society and the ways in which the arts empower people to create images, artifacts, performances, and structures that manifest their beliefs, knowledge, social relationships, values, and skills.

Interpret Art from Various Cultures and Historical Periods

Interpret works of art from various historical periods, cultures, and peoples, analyzing the context in which they were created, the characteristics of the works, and the range of possible interpretations.

Appreciate the Arts

Understand the significance and potential contribution of the arts to the quality of one's life.

Exhibit Skill in One Discipline of the Arts: Drama, Visual Arts, Music, Dance

Exhibit skill and understanding in at least one form of the arts, defining and responding to artistic problems with insight, technical ability, and quality.

Analyze and Critique Artistic Works

Analyze and evaluate works of art and performances from functional, structural/formal, historical, and cultural perspectives, using defensible criteria and communicating effectively through writing, speaking, and expressive media.

Second Languages

Oral Communication

Use spoken language to communicate the content of your message to others and to comprehend the content of others' messages to you.

Reading

Comprehend general meanings and specific details contained in written texts.

Writing

Convey content through legible and comprehensible text.

Culture

Use appropriate verbal and non-verbal expressions reflecting knowledge of the culture(s) in which a language is spoken.

APPENDIX H

Ford Motor Company

Introduction

In the spring 2000 semester, five individuals from the Human Resources unit in the Ford World Company Headquarters in Dearborn, Michigan, were interviewed about their competency-based selection and training system. Each individual interview during the site visit lasted between 50 to 60 minutes. Numerous company documents that provided additional insights about their competency-based model were reviewed by the consultant. The purpose of this case study was to explore the competency-based system at Ford Motor Company with a particular focus on the development of competencies, how they are assessed, and data ramifications.

The Setting

The Ford Motor Company produces cars and trucks. The company and its subsidiaries also engage in other businesses, including manufacturing automotive components and systems and financing and renting vehicles and equipment. Its automotive vehicle brands include Ford, Mercury, Lincoln, Volvo, Jaguar, and Aston Martin. Ford owns a portion of Mazda Motor Corporation. The Company also completed purchase of the AB Volvo's worldwide passenger car business.

There are six different leadership levels for salaried employees. The top level consists of about 40 officers, the next level includes approximately 200 executives, followed by 2,000 mid-level managers. There are about 40,000 entry-level managers. Ford Motor Company has structured "global excellence centers" where employees may work in manufacturing, purchasing, marketing, finance, business development, process leadership, or product development.

Identifying Important Outcomes

Ford Motor Company uses competencies in their selection, training, and promotion of global salaried employees. Ford defines competency as "an agreed upon set of knowledge, skills, abilities, experiences, values, or personal characteristics that we believe are necessary to run the business and achieve our business objectives" (Ford Motor Company, 2000, p. 4).

The competency model that Ford developed was based upon a formal review of existing models in other companies. Both an internal and external benchmarking process was followed by comparing themselves with other known companies that had the "best-in-class" selection procedures. Companies such as Philip Morris, Texas Instruments, and British Airways were contacted so that Ford could review and examine their practices. They performed an analysis of effective behaviors particularly for managers. They found that structured assessments (paper-and-pencil instruments and job simulations) were common across these companies.

The Ford Motor Company then constructed a composite of competencies that were reviewed by executives and then by the Executive Personnel Committee who had to formally approve them. The specific functions and levels of adaptation were left up to individual units to determine their specific applications. The initial focus and use of competencies for global salaried employees

selection were in four segments: (1) engineering, (2) human resources, (3) production and supervision, and (4) marketing and sales.

One main reason that Ford wanted to move toward using competencies in employee selection was so that they could provide the company with a competitive advantage. They also expected that using competencies would lead to the following strengths:

- Better prediction of job performance;
- Measure relevant skills and behaviors;
- Promote a global process;
- Be more flexible; and
- Be easier to administer.

The competencies are currently clustered into three main areas that are considered to be important leadership behaviors: (1) "heart," (2) "relationship," and (3) "know-how." Each cluster is briefly defined by a few key terms. Then, there are four subcategories under each major category that further define the specific competencies. The Ford Leadership Behaviors are outlined below (Ford, 2000).[1]

"HEART"

- **Integrity (Stays faithful to promises)**
  - Keeps one's work and commitments, exercises principled judgments, and accepts responsibility for actions;
  - Lives Ford Motor Company's values and demonstrates pride in our heritage; and
  - Accepts accountability for environmental and community responsibilities.

- **Courage (Willingness to act)**
  - Demonstrates reasoned fearlessness in taking risks that transform and grow the business;
  - Unafraid to act quickly for Ford Motor Company and consumer interests; and
  - Assumes personal responsibility for "doing the right thing."

- **Durability (Goes the extra kilometer)**
  - Maintains originality and creativity in staying the course to achieve agreed upon objectives;
  - Show tenacity and boldness in securing and using resources; and
  - Maintains inspiration, focus, intensity, and persistence, even under adversity.

[1] Material copied with permission of John M. Rauschenbarger, Ford Motor Company.

- **Drive for Results (Show passion for accomplishment)**
  - Determined to achieve challenging, innovative objectives and accepts personal responsibility for accomplishing them;
  - Prioritizes resources, inspire performance, enhances productivity, and measures outcomes; and
  - Negotiates agreements that move the business forward.

"RELATIONSHIP"

- **Teamwork (Gets on Board)**
  - Holds self and other personally accountable for engaging in team-oriented behavior;
  - Values different ideas, points of view, and backgrounds; and
  - Demonstrates respect and trust in fellow employees.

- **People Development (Cares, Nurtures, and Safeguards)**
  - Values and confidently promotes a diverse workforce;
  - Believes and practices continuous learning and develops self and others; and
  - Safeguards employees' personal well-being and ability to honor obligations to community and family.

- **Desire to Serve (Connects with the Consumer)**
  - Strives to develop a deep knowledge of consumer values;
  - Respects diversity of consumer needs, desires, and aspirations; and
  - Committed to surprise and delight the consumer.

- **Communication (Stays in Touch)**
  - Communicates/teaches Ford Motor Company's core purpose and values;
  - Listens completely; and
  - Communicates concisely with conviction and cultural sensitivity.

"KNOW-HOW"

- **Business Acumen (Shows Business Savvy)**
  - Knows Ford Motor Company's global business operations and the global business context in which the company operates;
  - Knows how to achieve consumer quality and profit outcomes in a global environment; and
  - Demonstrates functional and technical expertise.

- **Systematic Thinking (Sees Consequences and Potential)**
  - Thinks cross-functionally about ideas that impact the business;
  - Boldly pursues ways to improve processes and incorporate new ideas; and
  - Inspires systematic change efforts that make a difference.

- **Innovation (Ingenious in Applying Expertise)**
  - Demonstrates intensity and focus in discovering new ways of satisfying customers;
  - Discovers, empathizes with, and responds quickly to consumer dreams and aspirations; and
  - Committed to surprise and delight the consumer.

- **Quality Methods (Delivers Excellence)**
  - Shows passion for achieving quality and strives to continuously improve our business and behaviors;
  - Measures and monitors quality on an ongoing basis; and
  - Demonstrates commitment to meet customer quality requirements.

In addition to these leadership behaviors, Ford also contracted with external consultants to perform job analyses for the main clusters of workgroups (such as human resources and finance) to determine the characteristics and dimensions of effective performance. Industrial organizational psychologists served as the external researchers who studied certain managers for 3 to 5 years at Ford and identified effective performance. Once the external consultants completed the job analyses, then they also developed competencies linked to these clusters of workgroups. The results from these job analyses were then mapped onto the Ford leadership behaviors. All competencies are fairly steady over time. Even with changes in technology, the results from the job analyses are steady for several years.

Within the Human Resource System Infrastructure, these competencies guide processes at several points in time. First, competencies are used as a basis to screen individuals who are recruited for positions. Second, competencies are formally assessed to identify who will ultimately be selected or hired to fulfill specific positions. Competencies are used to evaluate the performance of management. They also guide the design of training seminars and workshops. Finally,

competencies are used to create development plans for leaders who aspire to make a lateral move within the company or seek a promotion.

Assessment Strategies at Ford Motor Company

Assessment at Ford begins with the recruitment of potential employees to be considered for professional positions. During the initial stage or pre-screening (usually conducted on college campuses), prospective applicants supply a resume that outlines their educational background and their work experiences as well as responsibilities. They also complete a structured interview that lasts about 30 minutes and a Situations Inventory (SI) (that takes about 35-45 minutes). The SI is a paper-and-pencil assessment that contains various scenarios that an applicant is likely to encounter on the job. The applicants are required to rate the desirability of various solutions. The specific situations and behavioral options were created by Ford employees in each job family. The SI is structured for engineering, production supervision, human resources, and marketing and sales.

Approximately 2,000 to 3,000 candidates are assessed each year. For candidates who make it to the next step, there is a formal assessment at Ford that involves two major stages. First, there is a structured 1-hour interview with each candidate. Then, all candidates participate in a job simulation that lasts 3 hours and 10 minutes. Ultimately, about half of the assessed candidates are hired.

The job simulation usually consists of several components. Candidates are randomly divided and placed into groups consisting of 12 members who are all applicants for positions at Ford. All assessments are developed by Ford employees and tailored to the specific job function as well as the competencies. Each team of individuals progresses through multiple assessments. One formal assessment is a case of an actual business problem. Teams of individuals write about their recommendations in terms of solutions to the particular problem. A second assessment is a stressful role-play situation. For example, an individual will need to respond to an irate customer or car dealer. Another assessment consists of an individual's presentation about solutions to a particular problem. The third assessment is a group discussion about a problem. Typically, these structured assessments are designed to address important competencies for about 2 years. Then they are modified as needed. Across these assessments, each assessor uses a checklist of behavioral indicators and rates each candidate's performance. The scale ranges from ineffective (with a score of "1") to very effective (with a score of "9").

Professional staff in an assessment center are trained for 2 days to learn how to evaluate a candidate's performance in the job simulation. Examples of effective performance serve as anchors that illustrate performances at each of the three different levels: very effective (scores ranging from 7 to 9), effective (scores ranging from 4 to 6), and ineffective (scores ranging from 1 to 3). Through this training process, assessors reach greater consistencies in their judgments about candidate's performances. Once professional staff complete their 2-day training sessions, they become certified assessors.

At least two assessors evaluate each simulation. A more highly trained coordinator supervises each pair of assessors. This coordinator is responsible for reviewing their assessments and then working with them to resolve any major differences in their ratings. They discuss reasons for significantly different judgments and then reach a consensus about a common specific rating.

There are no cutoff scores required to be hired at Ford. However, candidates who scored at the very ineffective level across all simulations and assessments would not be hired. Leaders at Ford believe that some skills can be strengthened once employees are hired. For example, some candidates may have weak writing skills, but through training at Ford, those skills can be improved.

The Human Resource staff believe their training of assessors strengthens the reliability of their results. In addition, they are making progress toward predictive validity, since they use actual problems that are encountered at Ford as the major assessments. The assessment system has not been in place long enough to reach strong predictive validity, but they view this as being accomplished with more experience over time.

These types of assessments are believed to ultimately improve selection decisions at Ford and to send a positive message about the company as well. In addition, since employees are assessed by formal methods, it increases objectivity and gives candidates better information upon which to decide if they want to work at Ford. Finally, the company gets an early glimpse into the skills and knowledge of each individual that allows them to know where the future employee needs further development once he/she is hired.

The costs associated with assessment are not issues for Ford. The belief is the more data that can be gathered about employee performance, the greater likelihood that an individual can work on weaknesses.

Assessment of Ford Leadership Behaviors: The 360 Degree Leadership Assessment Process

There are three major roles or groups of individuals who are directly involved in this particular assessment process. First, those being rated are receiving feedback on their leadership behaviors. Ratees must identify individuals whom they would like to evaluate their performance. Their list of nominees must include a direct manager and one matrix manager (if appropriate), six work partners, and up to six direct and/or matrix reports as raters, and individuals who have observed their leadership behaviors. Second, the raters are individuals who formally evaluate and provide feedback on leadership behaviors of particular individuals. Third, the manager reviews the direct results and integrates this information into the performance management process.

Ratees discuss their nominations with their direct managers and must get the managers' formal approval. Managers must evaluate whether the group of proposed raters are in the best position to provide knowledgeable feedback and unbiased feedback that is meaningful and useful.

All raters provide feedback on the Ford Leadership Behaviors via the Ford intranet. Raters are asked to provide a thoughtful assessment and constructive comments that will help their colleagues make important decisions about their leadership behaviors. The entire assessment is completed on line by the raters. Each individual is provided with scaled behavioral examples, used to help each rater make an informed judgment about an employee's leadership. The beginning instructions for this particular assessment include additional guidelines. Raters are asked to base their ratings on behaviors that they have observed during the past 12 months (not an old behavior or behaviors that they think someone might demonstrate in the future). They are to consider nonverbal behaviors too, particularly when there are significant differences between a person's words and actions. Raters are cautioned to make sure that they use the entire rating scale when appropriate. This caution is advised since some raters may be inclined to keep all ratings in the middle or at one end of the spectrum. The scale ranges from 1, ineffective, to 3, somewhat

effective, to 5, effective, to 7, very effective, to 9, role model. Following is one example of the key illustrations for one particular competency.[2]

Courage: The Willingness to Act

Ineffective Behaviors

- Tells others what they want to hear rather than discuss realities frankly;
- Does not commit to a course of action unless it has been planned and researched near perfection;
- Plays it safe rather than risk making mistakes; and
- Waits for others to take the lead or agree in challenging situations.

Effective Behaviors

- Addresses difficult issues, puts self on the line to deal with problems;
- Commits resources and/or time in the face of uncertainty to reach a challenging goal;
- Displays strong but realistic beliefs in own capabilities and ideas; and
- Acts decisively even with incomplete information and assumes responsibility for the outcome.

Very Effective Behaviors

- Questions organizational norms and accepted thinking and practices and champions better ideas for Ford Motor Company and the consumer;
- Takes on the task of communicating unpleasant feedback/information to colleagues;
- Supports and defends staff for taking calculated risks in order to transform and grow the business; and
- Takes bold, decisive actions despite risks, conflict or uncertainty; also takes on calculated, entrepreneurial risks and assumes accountability for outcomes.

Raters are also asked to consider actions not taken, as well as those taken. Raters are advised to avoid allowing initial impressions to bias their ratings, and they are not supposed to rely on their most recent encounter with someone when they are making their assessments. Raters are cautioned to be careful not to make generalizations from one aspect of a person's behavior to all aspects; rather, they are to examine each behavior individually. The behavior examples provided for each particular level of performance for each competency can really help raters provide informed assessments. They are asked to study the examples given and to consult them as they make their own judgments.

The employee and his or her manager closely review the final leadership assessment report. This information is used to help plan each individual's professional development. Together they review the relative strengths and weaknesses of performance, the behaviors where raters indicate

[2] Material copied with permission of John M. Raushenbarger, Ford Motor Company.

consensus, behaviors where raters' opinions differ significantly, behaviors where self-assessment is substantially different that those of other raters, and leadership behaviors that the manager and employee identify as the most critical to the employee's position. Ultimately, the manager and the employee will consider how the report can be used to plan the employee's professional development. It will also suggest how to improve upon specific leadership behaviors. Finally, the manager must integrate the feedback into the overall evaluation of each employee.

This information is encoded and sent to an outside vendor for consolidation and reporting. Then the report is sent on a confidential basis to the employee and his or her manager. Finally, the employee and his or her manager review copies of the Leadership Assessment Report and other relevant measures of performance. The manager uses this information to assess the employee's overall performance. The employee and manager jointly identify appropriate actions for the future.

Data Ramifications

The screening assessments to examine the skills and knowledge of potential employees are strengthened since there is a rigorous training process for all raters. This process helps to increase the reliability of ratings so there is more consistency across raters. In addition, each level of performance is clearly anchored with an example that helps raters to better understand the dimensions of performance associated with different levels. The validity of the assessment results seem fairly strong, since the problems reflect open-ended issues that capture the realities of the actual job. A clear benefit for potential employees is that they get a better understanding about what is important at Ford. The staff at Ford get more objective results, since all candidates are taking the same assessments. The use of multiple raters for each group of individuals also makes the assessments more reliable.

Ford staff hope in the future to establish predictive validity so that they can accurately predict who will perform most effectively in certain types of positions. They want to learn how to best match employees with certain jobs. As the assessments are used over time and data are evaluated, the staff want to be able to predict which employees would work best in certain positions. This is an ambitious goal that will take considerable time and expertise to achieve. However, clearly they have the expertise at Ford, and with more time to implement their new assessments, they will move in this direction.

Advantages and Challenges Associated with a Competency-Based System

One of the major challenges associated with this particular system is the enormous amount of time that it takes to conduct the performance assessments. It is a very hard process to manage, given the high numbers of individuals who are assessed by at least two raters. In addition, it is very expensive to implement. However, the leadership at Ford believes that the expenses are well worthwhile because they enable the company to hire the very strongest candidates possible. While campus interviews are the easiest to conduct, most individuals at Ford strongly believe the second layer of assessments conducted by the assessment centers are important to maintain as requirements for all prospective candidates. However, Ford is beginning to explore the possibility of offering some of the performance assessments as Web-based tools. These are early thoughts, but there is some serious concern with the amount of time (3 to 4 hours) that candidates spend completing their assessments. Each assessor spends a full day doing the evaluations and writing up his/her results for each small group of candidates.

The advantages associated with competencies include the belief that all units at Ford have a common understanding about them since they all use a common language across functions and units. Then assessments can be linked to these competencies to determine the levels of performance by employees.

Recommendations for Other Colleges and Universities

Individuals at Ford strongly encourage colleges to build a strong competency-based education model that specifically articulates the important skills and knowledge that students need to be effective. A strong model will be complex, but it is essential to embed these competencies across layers of the organization. When the competencies are embedded, then there are strong reinforcements of particular skills and knowledge across layers of the organization that help employees build stronger skills. Ideally, corporations should work more closely with colleges and universities to identify these important competencies.

Conclusion

The Ford Motor Company has established specific competencies that cut across all layers of the organization. Individuals seem to have a clear understanding about these competencies and they are directly aligned with formal assessments that are conducted at multiple points in time. Ford Motor Company has the advantage of being able to work with researchers and industrial organizational psychologists who can provide the necessary expertise to design assessments and then create feedback reports. The assessments have strong reliability, and validity should become more apparent as they are used over time.

References

Ford Motor Company. (2000). *Ford 2000*. Dearborn, MI: Ford.

APPENDIX I

CASE STUDY INTERVIEW PROTOCOL

Thank you for meeting with me today. As you know, I am interviewing you as part of a NPEC [explain NPEC if needed] project studying the data ramifications of competency-based initiatives.

1. What is your name and position? How have you been involved in [NAME OF COMPETENCY-BASED INITIATIVE]?

2. Describe how competencies are used in the [NAME OF COMPETENCY-BASED INITIATIVE] process.

   Probe: Were competencies particularly useful? If yes, how? If no, why not?

3. How were the competencies developed?

   Probe: Were competencies created from scratch or were they based on work done elsewhere?
   Probe: Are there any particular problems with "home-grown" competencies?
   Probe: At what level of specificity are the competencies expressed? Are they expressed numerically or qualitatively? Do they include cognitive and affective competencies? Attitudes or dispositions?

4. Who provided leadership in the development of the competencies? What groups were involved? Do these groups remain responsible for the competencies?

5. How are the reliability and validity of these competencies ensured?

6. How are you measuring the identified competencies?
   Probe: What types of assessments are used?

7. Are competencies linked structurally throughout the institution or organization? How? (For example, do program competencies guide course competencies?)

8. Are these competencies transportable? How do you ensure transportability?

9. Contrast the use of competencies with how the process was traditionally done.
   Probe: Is the competency-based process optional or required?

10. What policies needed to be altered in order to accommodate using competencies?

11. What would you do differently if you were to start over?

12. What recommendations would you offer to others who want to create competency-based learning experiences?

13. Is there anything else you would like to share about this competency-based initiative?

Thank you for your time. We appreciate your willingness to be interviewed.

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